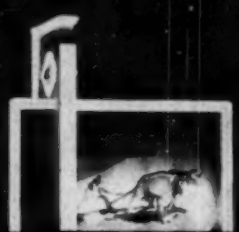
IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

IDEAS IN PROGRESS

SAN JOAQUIN



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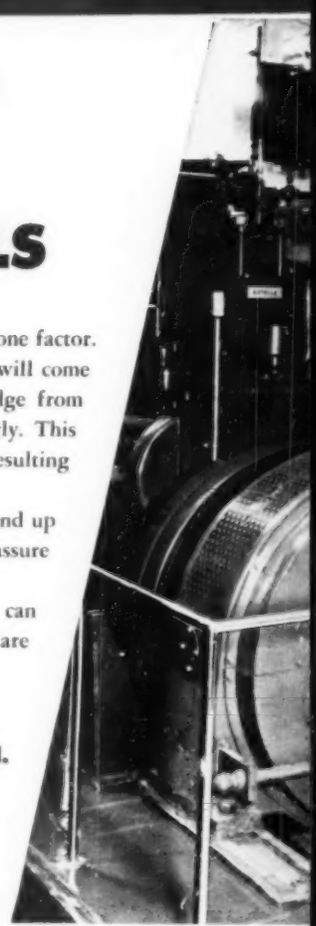
YOU CAN DOUBLE

Reduce Diesel fuel and maintenance costs by using TEXACO URSA OILS



Clean engines do more to assure Diesel economy than any other one factor. Use *Texaco Ursa Oils* and your maintenance costs, for example, will come down, because *Texaco Ursa Oils* keep harmful carbon and sludge from forming . . . keep rings free, ports open, valves working properly. This means, of course, better compression and combustion . . . with a resulting reduction in the amount of fuel used.

Texaco Ursa Oils are especially made to resist oxidation and to stand up under heat and pressure. They protect bearings from corrosion . . . assure longer life for all moving parts.

Leading Diesel manufacturers approve *Texaco Ursa Oils*, and you can get them in suitable viscosities for every type and size of Diesel. They are easily America's No. 1 Diesel lubricating oils. In fact—

More stationary Diesel h.p. in the U. S. is lubricated with Texaco Ursa Oils than with any other brand.

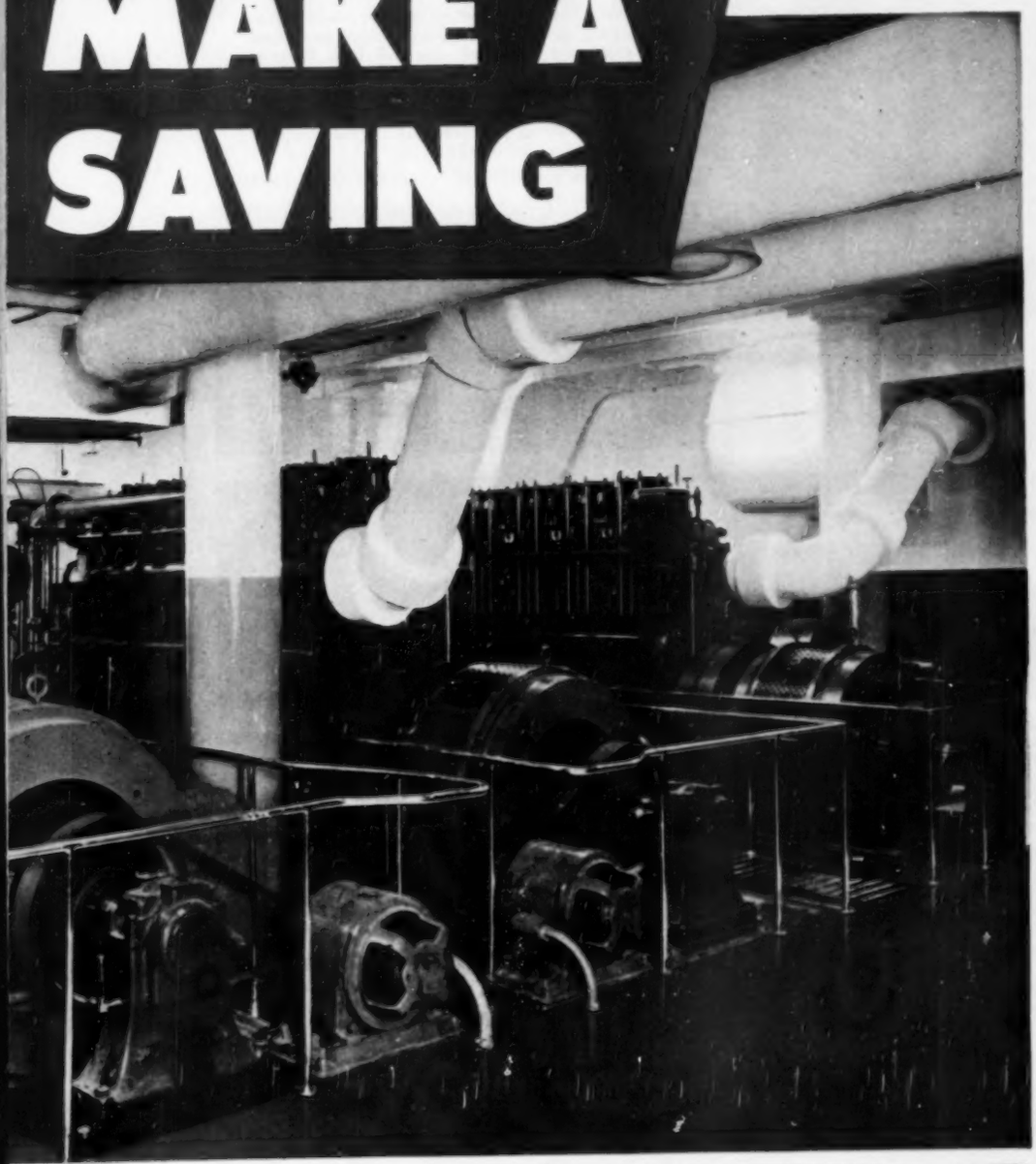
Get a Texaco Lubrication Engineer to show you how *Texaco Ursa Oils* can make a double saving for you on your Diesel operation. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO

DIESEL PROGRESS for September, 1950. Volume XVI, Number 9. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 816 North La Cienega Boulevard, Los Angeles 46, California. Rex W. Wadman, President. Subscription rates: $5 per year, single copy 50c. Acceptance under 34.64, P. L. & R., authorized.

MAKE A SAVING



URSA OILS FOR ALL DIESEL ENGINES

Reduce Engine Exhaust and Compressor Intake Noise—with

BURGESS-MANNING SNUBBERS

In every field of industrial activity where noise, gas surging, or harmful engine or compressor vibration cannot be tolerated, you will find Burgess-Manning Snubbers. Snubbers prevent noise by smoothing the intake air and dissipating the energy in the exhaust gas slugs, providing quiet operation without affecting performance. Write Burgess-Manning, today, for information.

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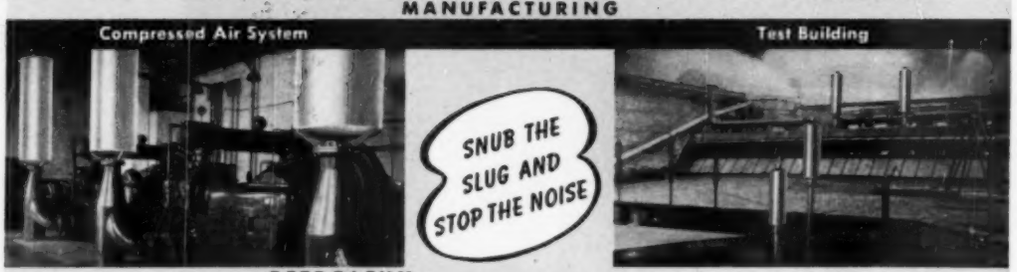

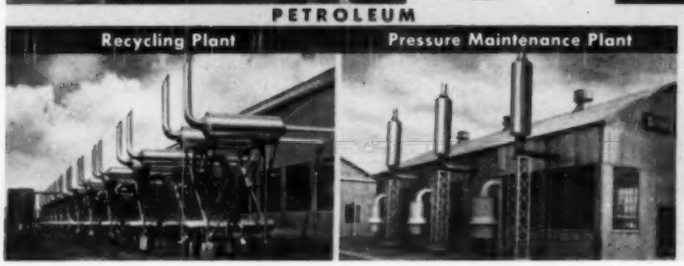

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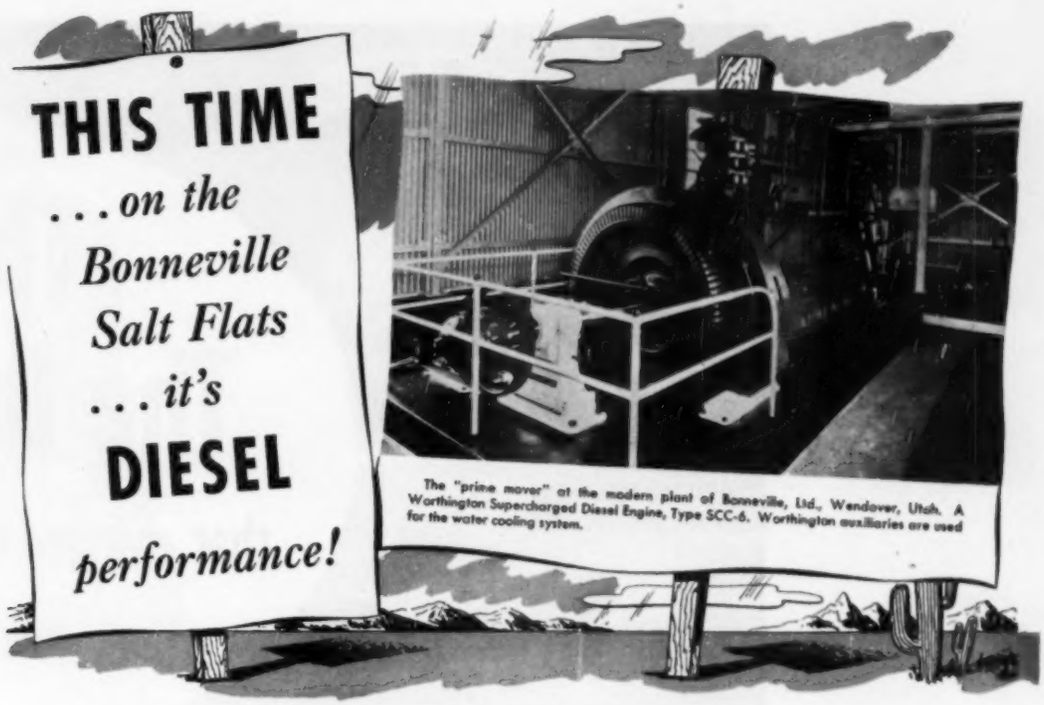
Burgess-Manning ACOUSTI-BOOTH

Thick walls of sound-absorbing material soak up noise. You can hear easily . . . talk comfortably in noisy surroundings. Suited to any location. Modern in appearance. Wall and floor models. Doorless.


THIS TIME
. . . on the
Bonneville
Salt Flats
. . . it's
DIESEL
performance!
The "prime mover" at the modern plant of Bonneville, Ltd., Wendover, Utah. A Worthington Supercharged Diesel Engine, Type SCC-6. Worthington auxiliaries are used for the water cooling system.

Worthington Engine Outstanding For Economy and Dependability Under Difficult Conditions

Organized in 1935, Bonneville, Ltd., is a primary source of commercial potash, producing 70,000 tons annually from the evaporating ponds in the Wendover, Utah, Salt Flats area. This remote site of the world's automobile speed records is far from public utility plants, even from adequate fresh water supply. Power, therefore, is a problem.

Management found the solution in a Worthington Supercharged Diesel, Type SCC-6, rated 489 hp at 4,250 ft elevation.

Replacing several small, high speed Diesels, the new Worthington unit is the sole electrical generating source in a set-up designed by Worthington engineers to deliver maximum power from the fuel consumed, and to operate with a cooling system requiring a minimum of make-up water.

For The Record

The Bonneville Worthington has lived up to every expectation for efficient, cost-cutting performance. *Consumption of fuel oil is at the rate of 14.25 kw hours per gallon at this altitude. Also, over 73% of the low-cost fuel oil is put to useful work — utilization of heat from the exhaust and from the cooling system (high-temperature type) being a main factor in achieving this high percentage.*

To a broad range of ratings including every type of heavy duty Diesel and gas engine, Worthington adds outstanding engineering knowledge and a rich background of experience — and technical assistance to help you get the most out of your own power planning. For further details of the dependable, economical Diesel performance that proves *there's more worth in Worthington*, contact *Worthington Pump and Machinery Corporation, Engine Division, Buffalo, New York.*

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YOUR PARTNER IN POWER PROGRESS

Diesel engines, 190 to 3,520 hp . . . gas engines, 175 to 3,520 hp . . . dual fuel engines, 225 to 3,290 hp.

WORTHINGTON-BUILT AUXILIARIES

Balanced Angle Compressors

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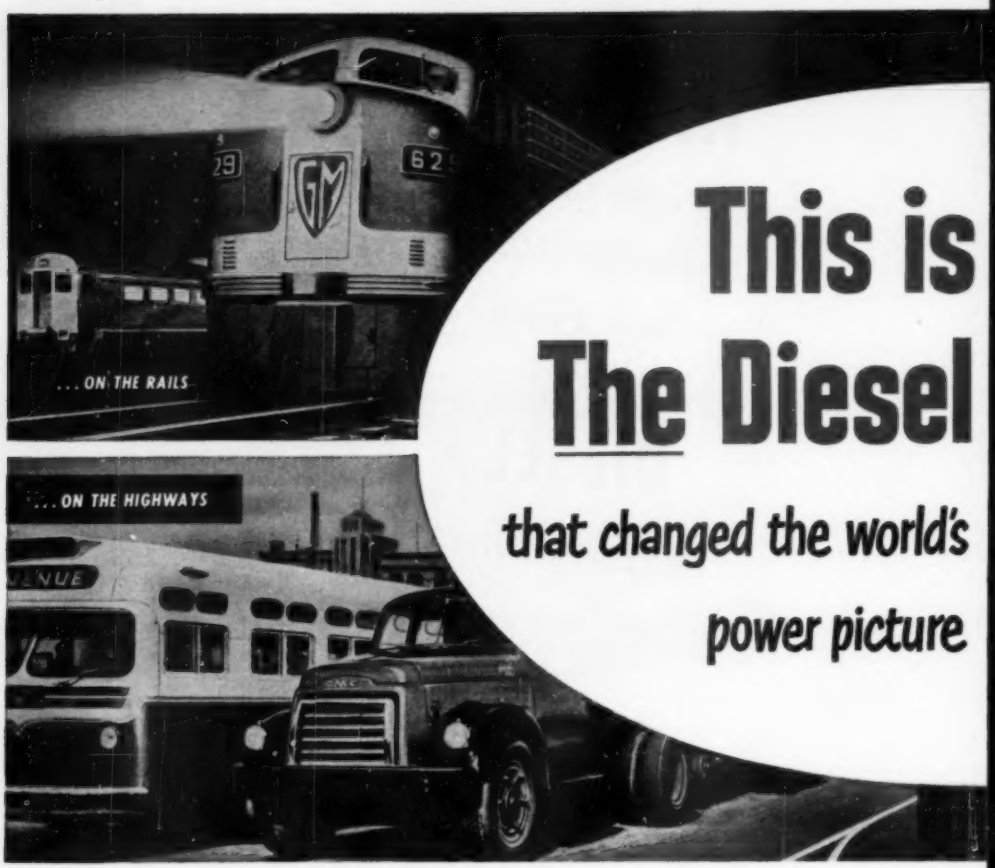


This is The Diesel

that changed the world's power picture

ONE DIESEL—and one alone—blazed a trail which has won world-wide recognition for the oil-burning engine as the most economical source of smooth, dependable, agile power for locomotives, trucks, buses, marine and other mobile uses.

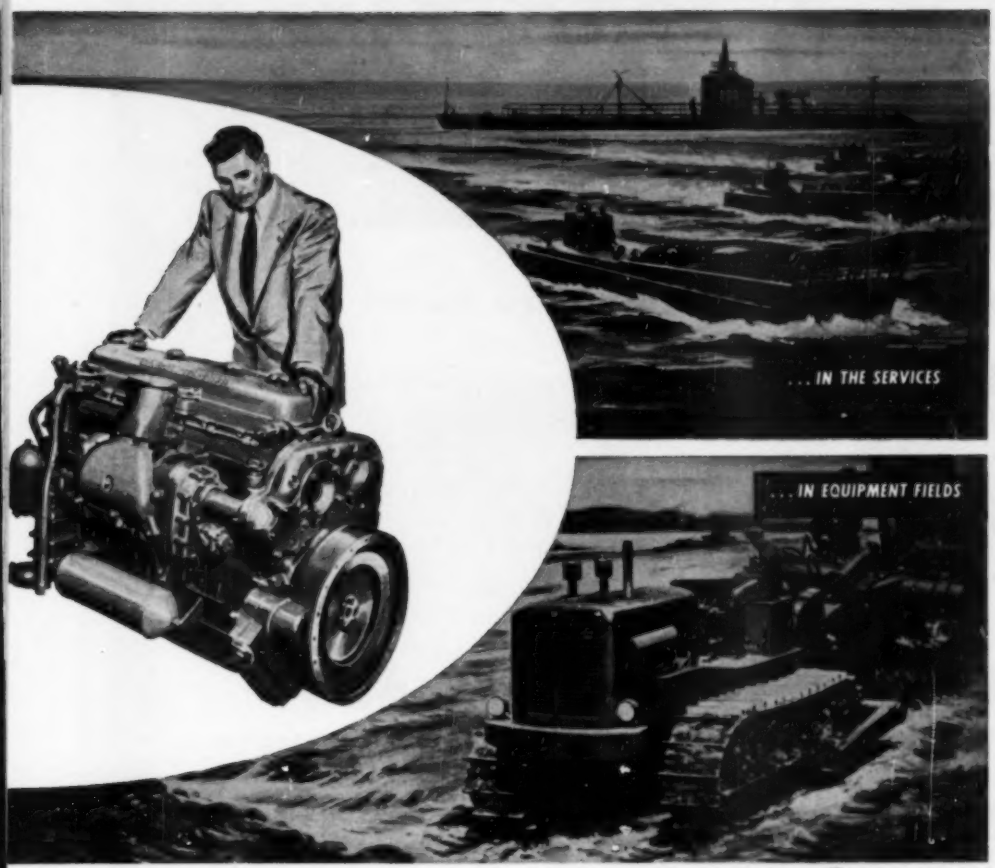
It is the General Motors Diesel engine, one size of which now drives most of America's crack passenger and freight trains. Another powers many of the Navy's submarines and other vessels.

And a third—the GM Series 71 engine—is the most widely used of all, totaling 46,000,000 horsepower. *It has surmounted the exacting conditions of War and met the economic requirements of Peace.* It has brought the same efficiency to a wide range of jobs, including many where Diesel power was never usable before.

That is because the "71," like all GM Diesels, is a two-cycle engine. Two-cycle means it produces power with every piston downstroke—in contrast to most other Diesels that generate power only on every second downstroke.

Equally important, GM Diesels have a direct jet-injection system that feeds fuel to cylinders in exactly metered charges—insuring better combustion and eliminating troublesome high-pressure fuel lines.

These basic differences make GM Diesels far more compact and much lighter than other Diesels of equal horsepower—without sacrificing ruggedness. These engines accelerate faster, are unmatched for smoothness, start quickly and are clean-burning.



"Your Key to GM Power Economy"

Today, GM Series 71 Diesel engines are taking the place of gasoline engines on many types of power jobs — of steam engines on land and sea — even of other Diesels because twelve years' experience has proved they are so dependable, so efficient, so economical.

General Motors 2-cycle Series 71 engines provide Diesel power at its best — *Diesel brawn without the bulk.*

Hear Henry J. Taylor on the air every MONDAY evening over the ABC Network, coast to coast.

Only GM Diesels provide all these advantages

- Smaller size, less weight per horsepower
- Two-cycle smoothness, power on every downstroke
- Quick starting, on its own fuel
- Unit injectors—no high-pressure fuel lines
- Rapid acceleration • Cleaner-burning
- Better high-altitude performance
- Easy accessibility

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GENERAL MOTORS

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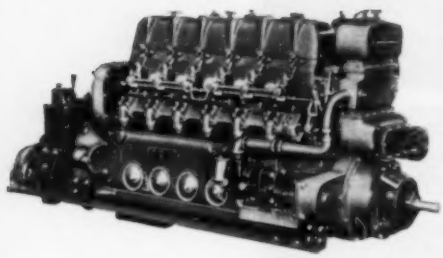
ALL THE ADVANTAGES OF THIS NEWEST 20 TO 138 HP. DIESEL ENGINE

Marine Model 49



Stationary Model 49

FAIRBANKS-MORSE MODEL 49

- efficient 2-cycle design
- lower weight per horsepower
- easiest to service
- more reserve power

New

UNITIZED CYLINDER HEAD AND LINER ASSEMBLY

Days of servicing or overhaul time are now shortened into hours with the new Model 49 design. Cylinder head, liner, piston, and rod assembly is quickly removed as a unit without disturbing engine mounting and without even dropping the oil pan. Complete cylinder assemblies are interchangeable, permitting transfer from one engine to another. Lost operating time is cut to a minimum.

Send Now For Catalog

A brand-new catalog is waiting for you — fill in this coupon and send it today. Get the whole story on this newest, finest, 20-138 hp. diesel engine.

Now is the time to send for complete information—the brand-new catalog—on the latest addition to the long line of well-known Fairbanks-Morse 2-cycle engines—the Model 49. See how its design embodies a new approach to diesel engine manufacture, with all major castings of lightweight corrosion-resistant alloys—combining lower weight per horsepower with new standards of operating efficiency.

You'll see how the Model 49 is simpler—easier to understand—with fewer parts—that it is the easiest to service diesel in its class. You'll note too, that there is a maximum interchangeability of parts among all models. Ideal for the broadest range of marine propulsion and generating service, the Model 49 is a thoroughly proved engine backed by over 10,000,000 Fairbanks-Morse Diesel horsepower.

FAIRBANKS-MORSE,

a name worth remembering

DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • SCALES
HOME WATER SERVICE AND HEATING EQUIPMENT • RAIL CARS • FARM MACHINERY

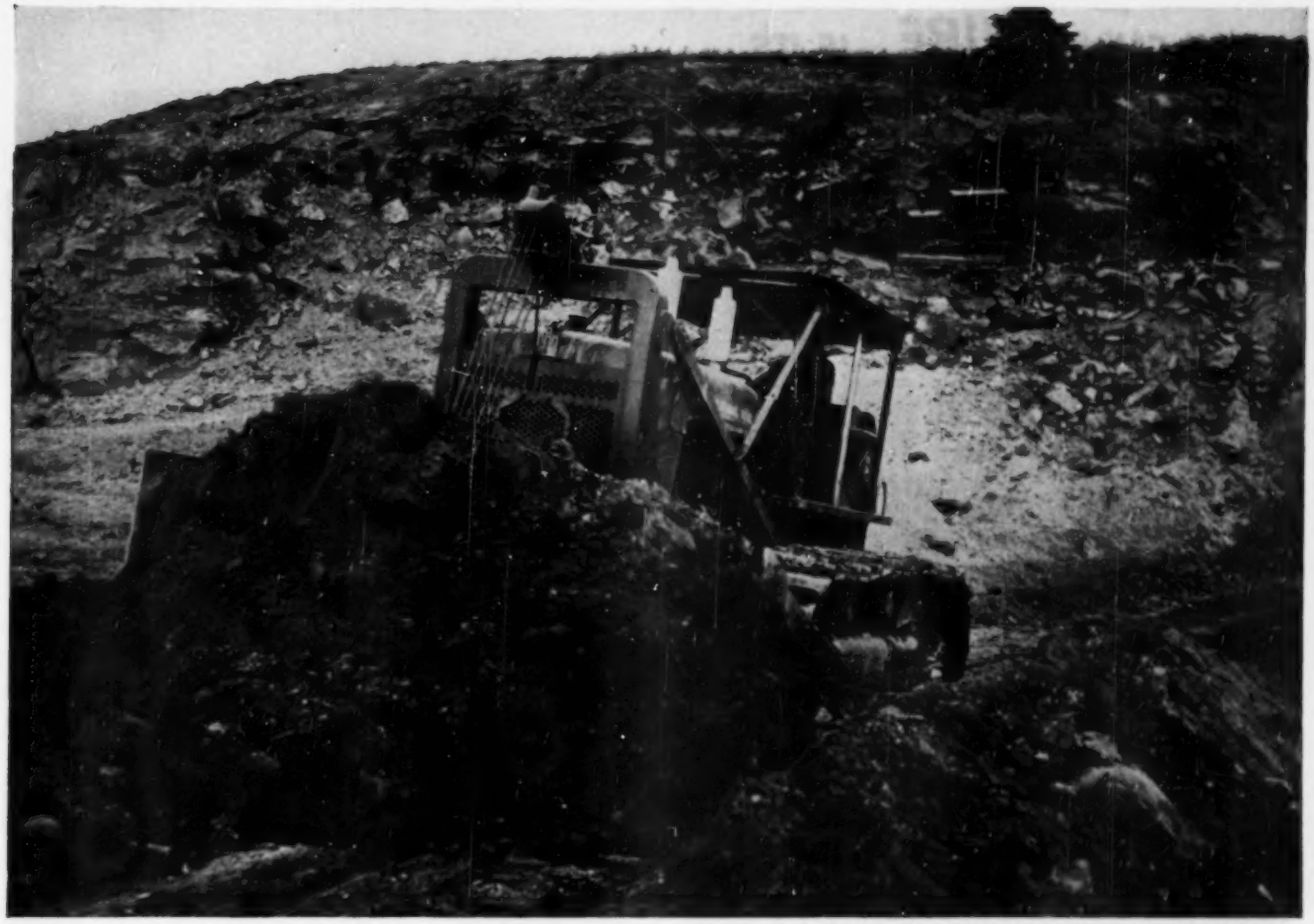
Fairbanks, Morse & Co.
600 South Michigan Avenue
Chicago 5, Illinois
Send me the new Model 49 Engine Catalog.

Name .....

Firm Name .....

Address .....

City ..... State .....



Here's another hard-working International Diesel Crawler with Purolator Oil Filters as original equipment.

A noseful of dirt can ruin an engine . . .

That pile of dirt is being kicked around . . . but it could turn the tables if it crept into the Diesel's oil stream. It's loaded with abrasives that can knock out an engine—lead to costly repair bills and loss of valuable job-time. It's dangerous stuff that must be filtered out of the oil in a hurry.

Here—as under all rugged operating conditions—you can rely on Purolator Micronic Oil Filters for a complete filtering job!*

Why? Because Purolator's exclusive Micronic element traps abrasives measured in microns (.000039 of an inch) . . . has a revolutionary accordion-pleated design which provides a filtering area up to 10 times that of old-style oil filters.

For fuel oil filtration, this means the complete job so vital because of close tolerances of injector plungers, and the microscopic size of injector tip orifices. And for lube oil filtration, Purolator's greater efficiency assures less wear on hard-working bearings and other vital parts.

We know that Purolators can solve your filtering problem. Let our engineering staff show you how!

*Reg. U. S. Pat. Off.

PUROLATOR PRODUCTS INC.
Rahway, New Jersey, and Toronto, Ontario, Canada

Protect your Power with Purolator!

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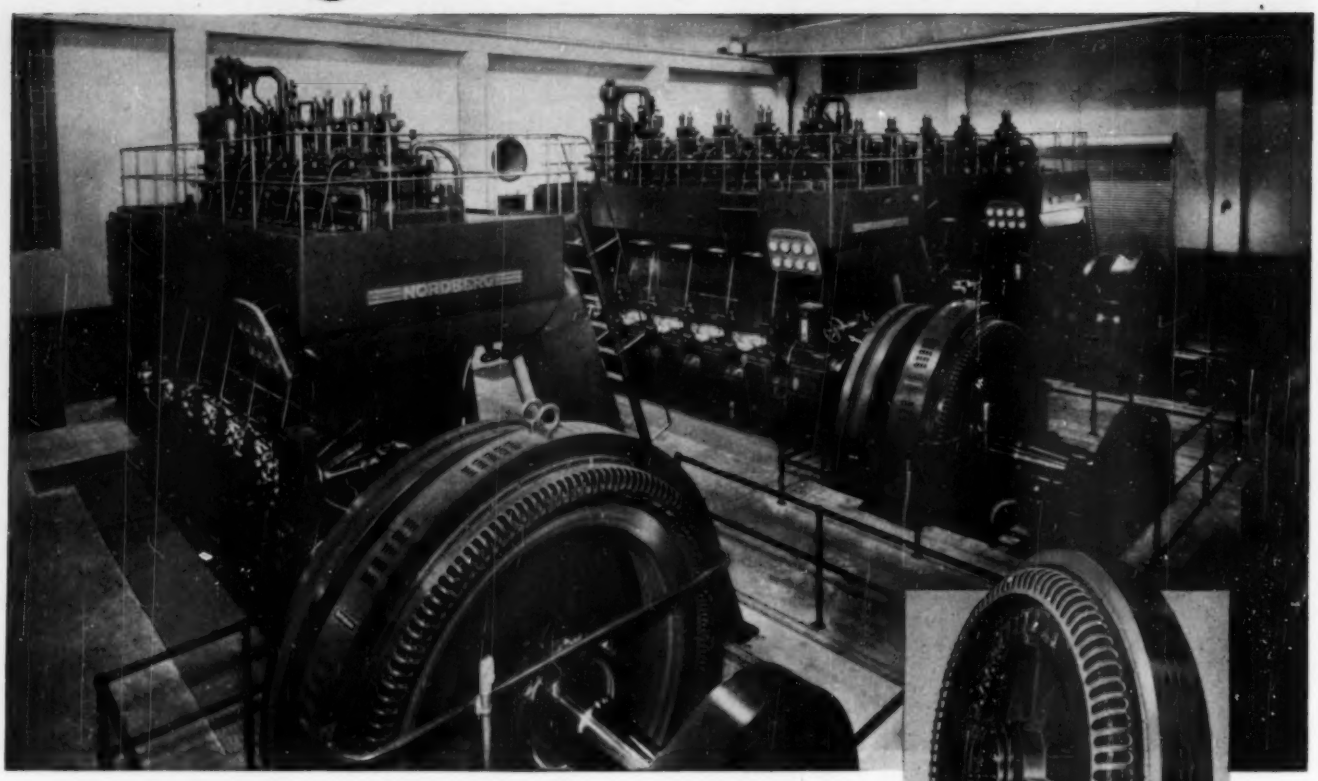
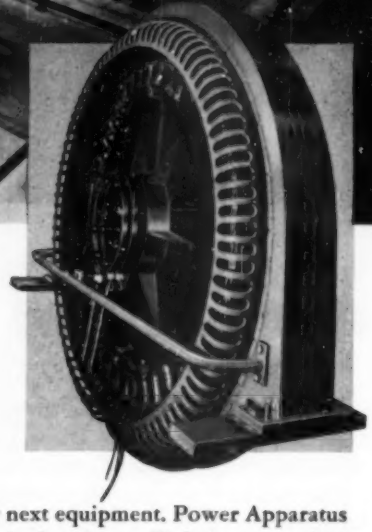
MICRONIC OIL FILTER
"FIRST IN THE FIELD OF FILTERING"

YOU CAN BE **SURE**.. IF IT'S

Westinghouse





Tough load problem solved with Westinghouse A-C Generators

A large western cement plant needed generating units to supply its power requirements including a 1000-hp motor. Starting motors this size puts a heavy load on the generators . . . causes considerable voltage drop. But, voltage drop had to be minimum. Consequently, standard generating units couldn't do the job. The diesel manufacturer—supplier of the complete unit—asked Westinghouse to build special generators to handle the job. The results are pictured above—another successful Westinghouse A-C Generator installation.

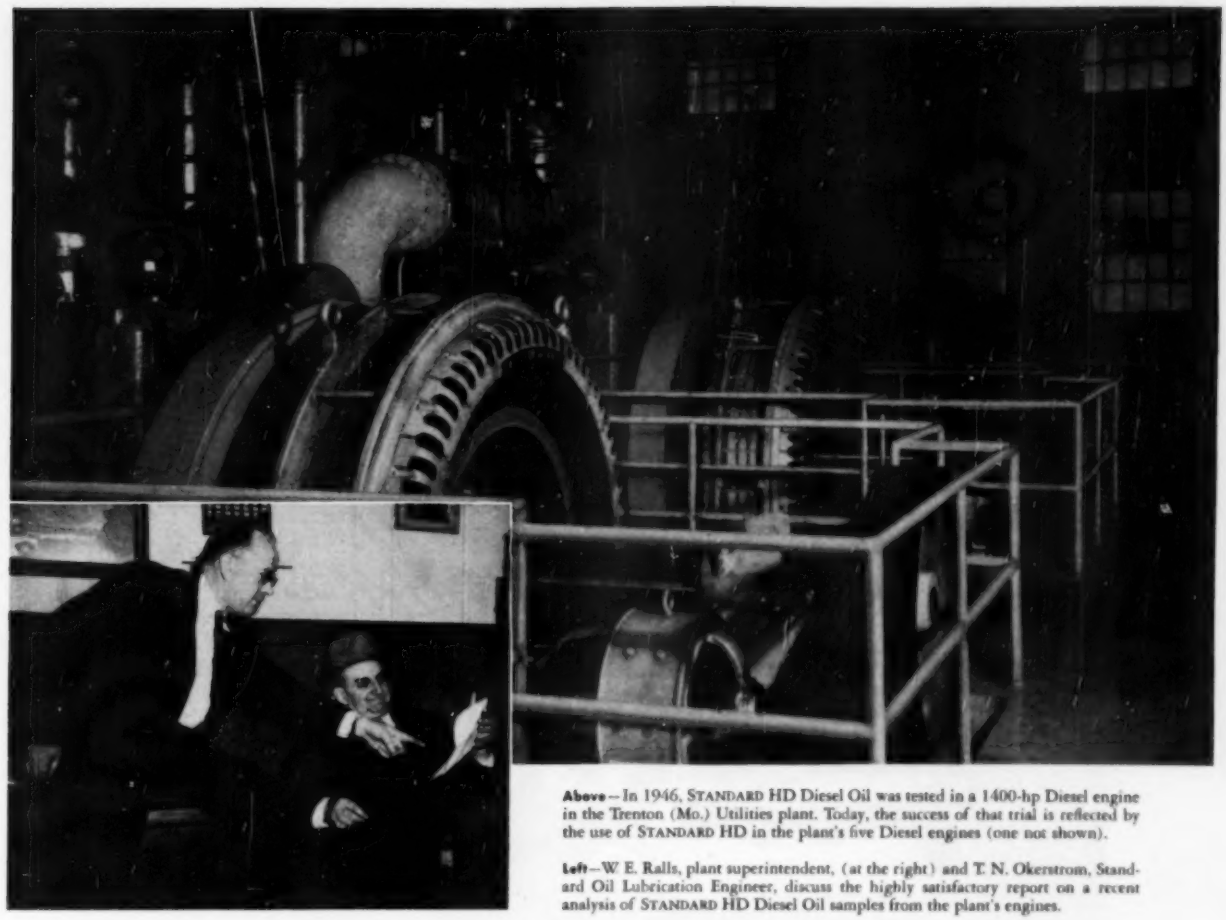
This example shows the problem-solving ability Westinghouse offers in building special generators for unusual applications.

Make certain you get the benefit of Westinghouse engineering on your next equipment. Power Apparatus Specialists—in principal cities—will help you select and apply the right equipment to the job. Consult them for any present or future plans.

Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21572

Westinghouse

DIESEL ENGINE DRIVEN AC GENERATORS



Above—In 1946, STANDARD HD Diesel Oil was tested in a 1400-hp Diesel engine in the Trenton (Mo.) Utilities plant. Today, the success of that trial is reflected by the use of STANDARD HD in the plant's five Diesel engines (one not shown).

Left—W. E. Ralls, plant superintendent, (at the right) and T. N. Okerstrom, Standard Oil Lubrication Engineer, discuss the highly satisfactory report on a recent analysis of STANDARD HD Diesel Oil samples from the plant's engines.

One good job leads to another . . . and another . . . and another!

The experience of W. E. Ralls, Superintendent of the Trenton Municipal Utilities plant at Trenton, Missouri, proves once again that reduction of downtime and maintenance is the Diesel operator's way to judge lubricating oil.

After talking with a Standard Oil lubrication specialist about the advantages of STANDARD HD Diesel Oil, Mr. Ralls put the heavy-duty lubricant to a test in the plant's 1400-hp Diesel engine. STANDARD HD came off with flying colors! The clean and trouble-free operation of this unit sold the new lubricant right into the plant's three 650-hp Diesels. When a new 1600-hp engine was installed in 1948 that, too, was filled with STANDARD HD Diesel Oil.

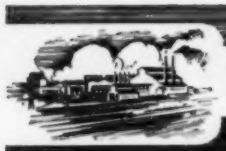
Today, the success of STANDARD HD on one job after another in this plant is reflected in more reliable Diesel operation and lower maintenance costs.

Let a Standard Oil lubrication specialist help you find how STANDARD HD Diesel Oil can reduce maintenance and overhauls. You can reach him quickly and easily by phoning the nearest local Standard Oil (Indiana) office. Or, if you wish, write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

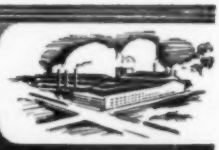
STANDARD HD
TRADE MARK
Diesel Oil

STANDARD OIL COMPANY (INDIANA) STANDARD

A honking flight of geese slicing effortlessly through the crisp autum sky . . . an objective in mind . . . Winter under warm Southern skies! Unerring accuracy, perfect coordination, instinctive, unbroken "V" formation to the objective. Here at Erie Forge our one objective is to produce diesel crankshafts, connecting rods, drive shafts and steel castings second to none in fine quality and lasting durability. An objective in mind . . . From careful metallurgical analysis of raw and processed material to skillfully applied experience in the principles of fine craftsmanship . . . and finally to the minute accuracy of the finished product . . . every operation is completely controlled and achieved within the walls of our own plants here at Erie Forge. Your requirements will receive our intelligent scrutiny and our earnest effort . . . will you consult with us?



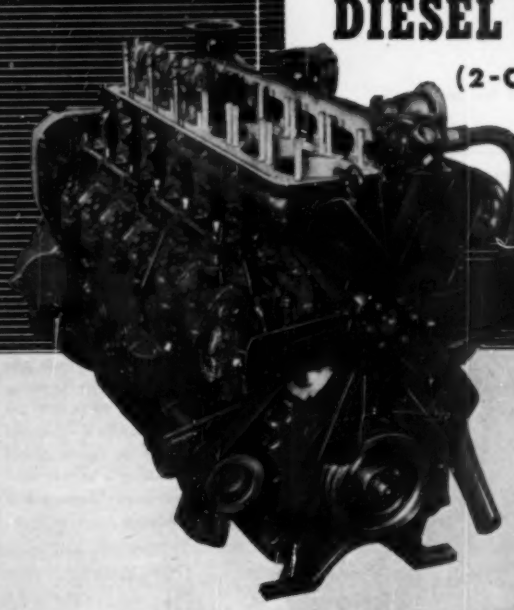
ERIE FORGE COMPANY, ERIE, PA.



FASTER SERVICING

P&H DIESEL ENGINES

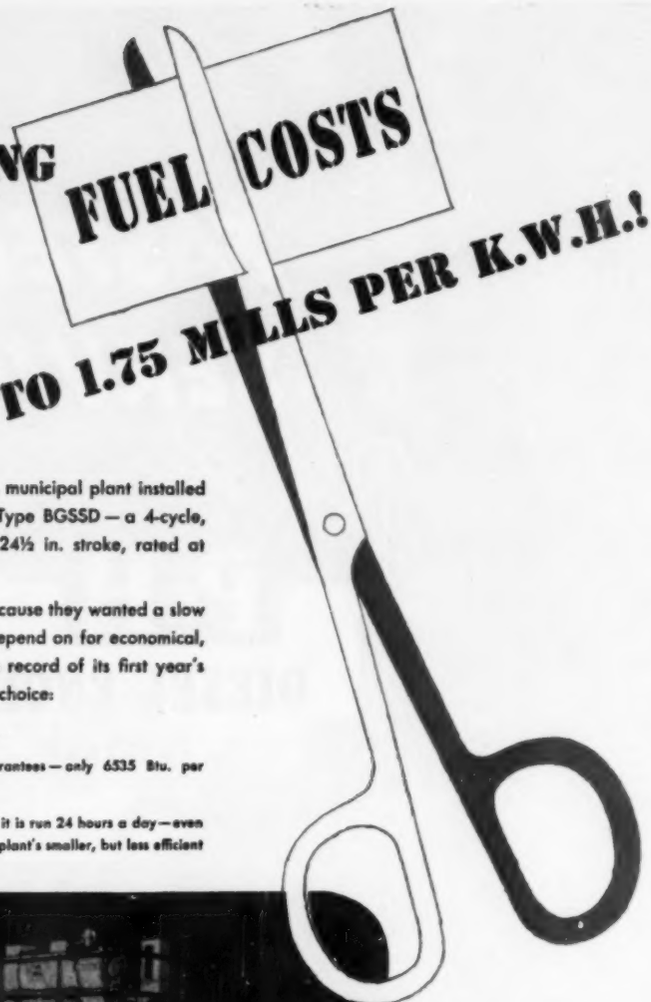
(2-CYCLE)



● The complete cylinder assembly is identical for *all* P&H Diesels — 1, 2, 3, 4 and 6 cylinder models. Replacements can be made in the field — from one engine to another — saving hours — even days on the job. Another good reason for standardizing on P&H Diesels. For literature, write Diesel Division, Harnischfeger Corporation, Port Washington, Wisconsin.

P&H DIESEL DIVISION
HARNISCHFEGER CORPORATION
PORT WASHINGTON WISCONSIN, U.S.A.

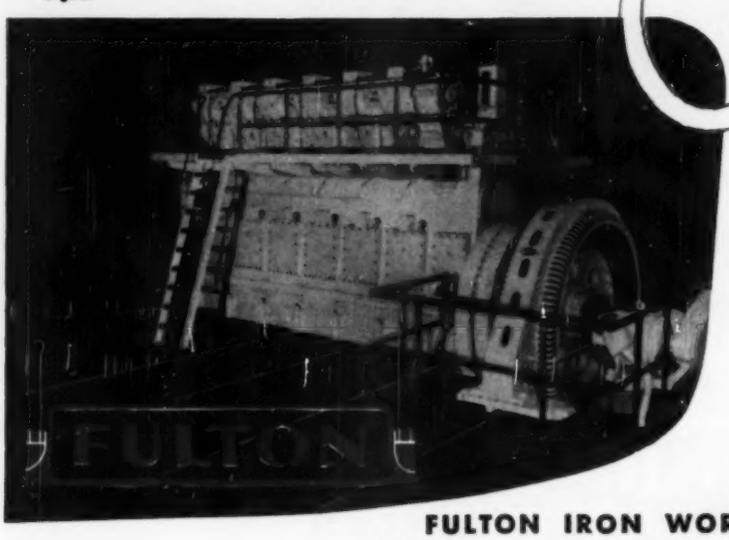
FULTON DUAL-FUEL CUTS CUSHING FUEL COSTS TO 1.75 MILLS PER K.W.H.!



In June, 1949, the Cushing, Oklahoma, municipal plant installed this Supercharged FULTON Dual-Fuel Type BGSSD — a 4-cycle, 6-cylinder engine with 17½ in. bore, 24½ in. stroke, rated at 1,420 HP at only 277 rpm.

The city's engineers chose a FULTON because they wanted a slow speed, heavy duty engine they could depend on for economical, unfailing service over many years. The record of its first year's performance proves they made a wise choice:

- Fuel costs total just 1.75 mills per K. W. H.
- Btu. consumption always lower than guarantees — only 6535 Btu. per Bhp./Hr. at full load
- The FULTON Dual-Fuel is so economical that it is run 24 hours a day — even at 60% loads which could be carried by the plant's smaller, but less efficient engines



Only FULTON Dual-Fuels give you such remarkable operating economy plus PUSH-BUTTON DUAL-FUEL SWITCH — 2-second change-over by remote control without missing a beat or leaving your seat! *Compare* and you'll choose

FULTON IRON WORKS COMPANY

SAINT LOUIS 14, MISSOURI • New York Office: 82 Wall Street, New York 5

*COLOR

For maximum production . . . top efficiency . . . lowest operating cost, give your machines the finest in lubricants—give them Tycol oils and greases.

Tycol lubricants are made to meet every lubrication need of industry—from roll neck greases for steel mills to spindle oils for textile plants.

Each Tycol lubricant is subjected to rigid tests during manufacture. This control assures the required lubrication characteristics—*COLOR, penetration, viscosity, to name a few—for maximum performance of that particular product. At every step from selection of crudes to blending of the finished product, Tycol lubricants provide maximum lubricating efficiency which means greater economy, longer life for every type of equipment.

Tide Water Associated will be glad to assist you in selecting the Tycol lubricant best suited to your specific need. Call or write your nearest office for further details.

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TIDE WATER ASSOCIATED OIL COMPANY

17 BATTERY PLACE · NEW YORK 4, N. Y.

*LEARN WHAT THIS PRODUCT CHARACTERISTIC MEANS TO YOU — READ "LUBRICANIA" This informative handbook, "Tide Water Associated Lubricania," gives clear, concise descriptions of the basic tests used to determine important properties of oils and greases. For your free copy, write to Tide Water Associated Oil Company, 17 Battery Place, New York 4, N. Y.

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MADISON-KIPP *Fresh Oil* LUBRICATORS

. . . provide the most dependable method of lubrication ever developed

Oil under pressure fed drop by drop from a Madison-Kipp Lubricator will definitely increase the production potential for years to come when applied as original equipment on new machine tools, work engines, and compressors. There are six popular models for every application. Write for special engineering data for your particular requirement.

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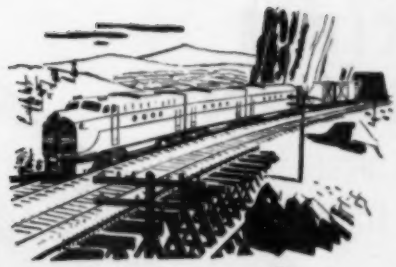
ANCIENS ATELIERS GASQUY, 31 Rue du Marais, Brussels, Belgium, sole agents for Belgium, Holland, France, and Switzerland.

WM. COULTHARD & CO. Ltd., Carlisle, England, sole agents for England, most European countries, India, Australia, and New Zealand.

- *Skilled in* DIE CASTING *Mechanics*
- *Experienced in* LUBRICATION *Engineering*
- *Originators of Really High Speed* AIR TOOLS



Fuel cost on freight trains reduced 58%

Between July 1949 and the end of the year, the Chicago and North Western Railway increased its fleet of General Motors Diesel locomotives from 47 to 107 units. This new equipment made it possible for the railroad to handle 60.7% of its freight gross ton-miles with Diesel power.

Fuel cost on these Diesel units was 14 cents per 1,000 gross ton-miles as compared with 31.2 cents on steam locomotives handling the balance of freight operations—*a saving of 58% in favor of GM Diesels!*

The North Western has since added 30 more GM Diesel units which will enable the carrier to haul a still larger percentage of its freight at reduced fuel cost.

Fuel economy is only one reason why so many railroads are dieselizing more and more of their freight, passenger and switching operations. Greater dependability, lower maintenance, more economical parts replacement—all help offset other rapidly increasing railroad costs.

Strong solvent railroads in the hands of competitive industry are essential to America's prosperity and growth. Fifteen years' experience has demonstrated that dieselization with General Motors locomotives is the soundest investment a railroad can make.

GM
GENERAL MOTORS
LOCOMOTIVES

A Green Light for Economy in Railroad Operation

ELECTRO-MOTIVE DIVISION

GENERAL MOTORS • LA GRANGE, ILLINOIS

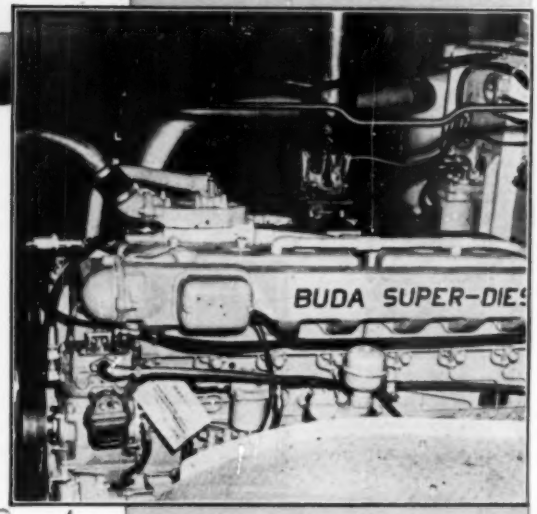
Home of the Diesel Locomotive

FLEXIBLE HOSE LINES

WITH DETACHABLE, REUSABLE FITTINGS

Aeroquip

Always first
ON HEAVY MOBILE EQUIPMENT



Save time, save money and reduce inventory by putting the "Aeroquip Idea" to work for you. With Aeroquip you make your own flexible hose assemblies by cutting bulk hose to desired lengths and attaching Aeroquip Reusable Fittings. Assembly can be accomplished quickly and easily right on the job. No special tools are required. No training is needed. Aeroquip high quality Flexible Hose Lines improve performance and reduce maintenance. They eliminate leaks due to vibration and operate dependably at extremely high or low temperatures. They are widely used for hydraulic fluid, water, air, lubricating oils, gas and Diesel fuels and many other fluids.

This engine is plumbed with Aeroquip Flexible Hose Assemblies. The detachable, reusable fittings make it possible to service mobile equipment quickly on the road or in the shop. A small inventory of Aeroquip Hose and Fittings reduces downtime and helps maintain schedules.

Always first

BD check into the money saving idea—

AEROQUIP CORPORATION

JACKSON, MICHIGAN

SALES OFFICES AND WAREHOUSES: 1053 NO. HOLLYWOOD WAY, BURBANK, CALIF. 1215 SO. EAST GRAND AVE., PORTLAND 14, ORE. 2912 N. E. 28TH ST., FORT WORTH 11, TEXAS 72-74 STAFFORD STREET, TORONTO, CANADA 4301 N. W. 36TH ST., MIAMI SPRINGS, FLORIDA

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AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U. S. A. AND ABROAD

Cummins® Custom-built Diesels

Built not once but Twice

The better-built engine for more profitable power

Yes, they're actually built *twice*. That's what makes a lightweight, high-speed Cummins Diesel such an efficient, dependable, precision-made engine. After initial assembly, each engine is run-in on the test block. Then it is torn down and carefully re-inspected—after that it is re-assembled and tested *again* to assure *peak performance*.

The finest of engine craftsmanship . . . exclusive Cummins fuel system . . . engines that are "custom-built to fit the job" . . . make a Cummins Diesel a *better buy for your power needs*.

Contact your Cummins dealer. He has more facts to show you about making more profits with

Diesel power by CUMMINS

TRADEMARK REG. U.S. PAT. OFF.

CUMMINS ENGINE COMPANY, INC. · COLUMBUS, IND.

EXPORT: CUMMINS DIESEL EXPORT CORPORATION
Columbus, Indiana, U. S. A. · Cable: Cumdiex

Lightweight High-speed Diesel Engines (50-550 hp) for: On-highway trucks · off-highway trucks · buses · tractors · earth-movers · shovels · cranes · industrial locomotives · air compressors logging yarders and loaders · drilling rigs · centrifugal pumps generator sets and power units · work boats and pleasure craft.

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FOR AUTHORIZED SERVICE ON

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FUEL INJECTION EQUIPMENT

SCINTILLA MAGNETO DIVISION of Bendix AVIATION CORPORATION
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WESTERN OFFICE: 582 Market St., San Francisco, Calif.
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First Diesel-Electric Drive Tug OF THE GREAT LAKES FLEET

AN OUTSTANDING IMPROVEMENT in the fleet of the Great Lakes Towing Company is the repowered tug *Ohio*, in which General Motors Diesel-Electric Drive has been installed for main propulsion power. Operating in Cleveland Harbor and the crooked Cuyahoga River, her new power plant affords improved maneuverability. Further, it is another milestone in the smoke-abatement program for the city of Cleveland.

Repowered tug Ohio. Owned and built by Great Lakes Towing Company, Cleveland, Ohio. Over-all length 81 feet, beam 20 feet, draft 12 feet, 6 inches.

ENGINES FROM 150 TO 2000 H. P.

General Motors Diesel-Electric Drive has powered more than 700 vessels in 22 different classifications.

GM GENERAL MOTORS DIESEL POWER

Leader in Diesel engineering development for 38 years

Cleveland Diesel Engine Division

CLEVELAND 11, OHIO

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Why PORTLAND Modernizes with MACK Diesels..

32 MACK DIESEL BUSES RETIRE LAST STREETCARS FROM OREGON'S LARGEST CITY

"For Public Acceptance . . Performance . . Economy . . . *WE CHOSE MACKS!*"

says **GORDON G. STEELE**, *President of Portland Traction Co.*

● In line with their established policy of always giving patrons the best city transportation vehicles possible, Portland Traction Co. has put into service 32 Mack Diesel Buses to reach a long-anticipated objective of complete modernization.

"Our reasons for selecting Mack Diesels are based on careful study of experience of various operations with different types and makes of vehicles," states Mr. Steele. "We checked cities with new Mack Diesels in operation for *public acceptance* and found patrons well pleased. We also checked Mack Diesels for *economy*—based on year after year operating and maintenance costs—and for *performance*, a prime factor with our hills, narrow streets and heavily congested traffic. On all counts, we found Macks very satisfactory."

BE PROFIT-WISE

Modernize with Mack **Outlasts them all**

Diesel or Gasoline Transit Buses
Also Conventional or School Bus Chassis

MACK MANUFACTURING CORPORATION
Bus Division
Empire State Building, New York 1, N. Y.

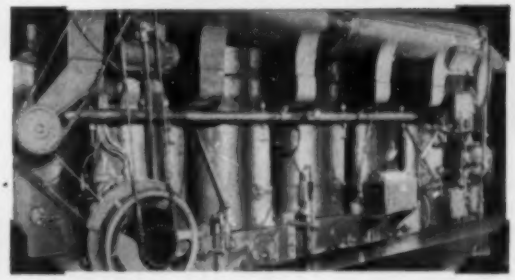
Factory branches and distributors for service and parts in all principal cities.
In Canada: Mack Trucks of Canada, Ltd.

STANDARD ENGINEER'S REPORT

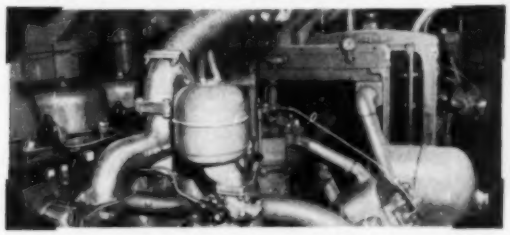
DATA

LUBRICANT RPM Delo Oils
UNIT 275 H.P. Union diesels – 6 cyl. 11" x 15" M.V. Komoku
LUBRICATOR Dry sump
CONDITIONS Intermittent operation Capacity loads against strong tides
PERIOD 12 years
FIRM Bay & River Navigation Co., San Francisco

No stuck rings or bearing failures in 12 years!



HAULING 900-TON-AVERAGE LOADS, the M. V. Komoku's two 275 H.P. high-speed diesel engines have been lubricated with RPM DELO Oils since the vessel was built in 1938. "In all that time," says Chief Engineer R. B. Gibson, "we haven't had ring or bearing trouble. About 5 years ago we pulled the pistons, but there was so little wear we only installed standard rings. We grind exhaust valves yearly, intakes every two years." RPM DELO Heavy-Duty Lubricating Oil keeps these engines clean and lubricated.



FIVE CATERPILLAR AND BUDA DIESELS are also on the M. V. Komoku to operate air compressors, generators, etc. . . . are lubricated with RPM DELO Heavy-Duty Oil. In varying periods, RPM DELO Oils have prevented ring, cylinder or bearing trouble in any of them.

REMARKS The M. V. Komoku transports sugar from upper San Francisco Bay to various terminals. Strong tide flow, common in the Bay, often makes heavy going for her engines.

RPM DELO Oils are designed to meet every heavy-duty engine need. Besides RPM DELO Heavy-Duty Oil in the Komoku, the other high-performance grades are RPM DELO Special, RPM DELO Supercharged-1, RPM DELO Supercharged-2 Lubricating Oil.

RPM DELO LUBRICATING OILS

How RPM DELO OILS keep engines clean and prevent wear

A. Contain special additives that provide metal-adhesion qualities . . . keep oil on parts whether they are hot or cold, running or idle.

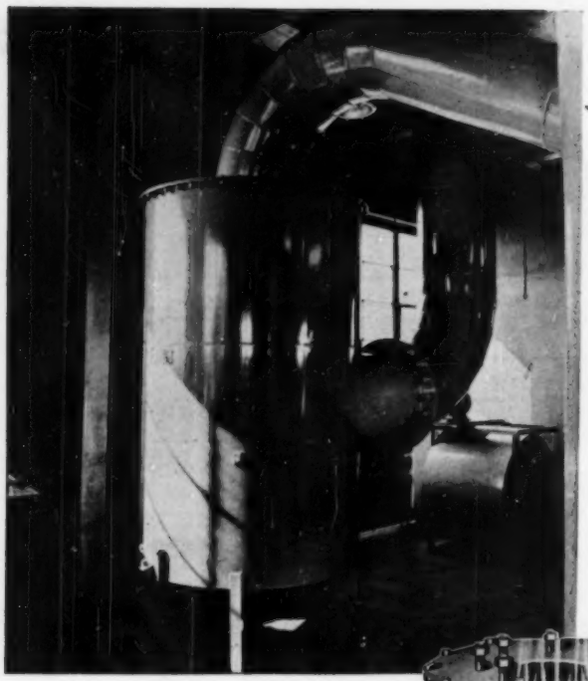
B. Anti-oxident resists deterioration of oil and formation of lacquer . . . prevents ring-sticking. Detergent keeps parts clean, helps prevent scuffing.

C. Special compounds stop corrosion of any bearing metal, and oil foaming in both wet and dry sump engines.

FOR MORE INFORMATION about the proper grade of the new RPM DELO Oils to fit your particular requirements, or the complete line of RPM Lubricants, and the name of your nearest "RPM" Distributor, write or call any of the companies listed below.

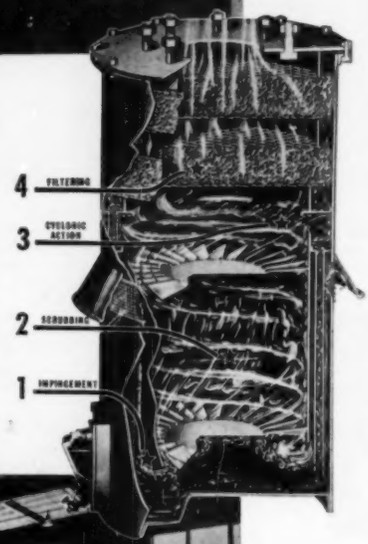
Trademark "RPM DELO" Reg. U. S. Pat. Off.

STANDARD OIL COMPANY OF CALIFORNIA • San Francisco
THE CALIFORNIA OIL COMPANY • Barber, N. J., Chicago
STANDARD OIL COMPANY OF TEXAS • El Paso, Texas
THE CALIFORNIA COMPANY • Denver, Colorado



let it snow!

this Cycoil® is indoors out of the weather



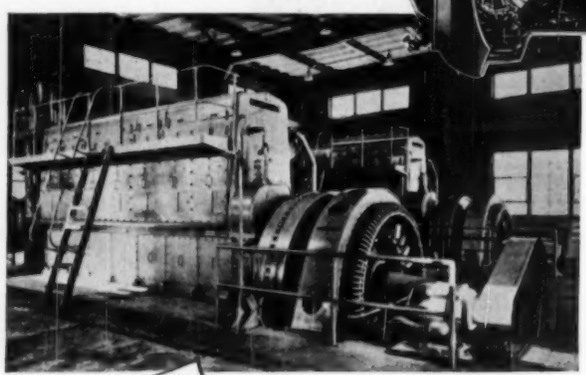
Cycoil Oil Bath Air Cleaner provides 4 way cleaning—Impingement, Scrubbing, Cyclonic Action and Filtering.

Filtration through Double Cells completes cleaning action eliminating oil mist from air.

Cyclonic action induced by vanes throws oil containing dust outward.

Scrubbing action, thoroughly mixes air and oil, entraining all dust particles.

Impingement of dirty air against oil, deposits the heavier dust particles immediately. Oil and air mixture then passes upward with whirling motion through vanes to succeeding cleaning steps.



These 1425 H.P. Nordberg Diesels breathe the world's cleanest air, made that way by AAF—the world's greatest name in air cleaning.

THIS Cycoil* at the Milford, Maine plant of Bangor Hydro-Electric Company has a tangential intake and is housed indoors for cold-weather protection. This type of intake keeps oil flowing when the mercury indicates "no-pour" temperatures. Cycoil is adaptable to many conditions—maintains steady year 'round function to protect costly engines.

With Cycoil, these Nordberg Diesels have the best known protection for uninterrupted service. AAF's Cycoil cleans the intake air for diesels in 4 ways, as explained in the drawing above. Its oil bath and cyclonic action removes more than 90% of all dust by oil immersion. Intense centrifugal action captures dust particles even before the air is filtered. Positive oil circulation maintains a self-cleaning action. Final air cleaning by filter pads in a double cell design offers nearly 100% dust elimination. For large dust-handling capacity, AAF's Cycoil has no equal. Just ask a diesel engineer.

Whatever your problems with air, to protect engines for continuous operation, call upon AAF's air experts.

For engineering details and complete explanation of performance standards on Cycoil write for Bulletin 130-E.

*Oil bath air cleaner.

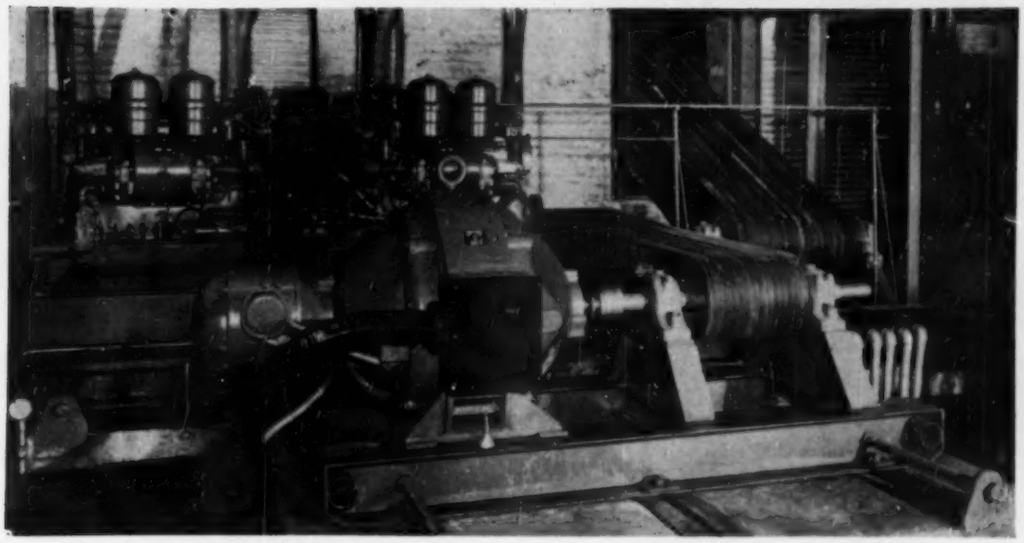
Today's Best Buy is Better Air!

AAF **American Air Filter**
COMPANY, INC.

408 Central Avenue, Louisville 8, Kentucky • *In Canada:* Darling Bros., Ltd., Montreal, P. Q.

STEWART & STEVENSON ENGINEERS RE-POWERED THIS TEXAS COTTON OIL MILL . . .

from Steam to Diesel in ONLY 42 days



Here is a case where Stewart & Stevenson's "know how" and service really paid extra dividends. This mill's 49-year-old steam power plant failed completely and was in no condition to be repaired again. Within only four days after Stewart & Stevenson was contacted, detailed engineering plans and specifications for a complete modern GM Diesel power plant were submitted to the management. On the forty-second day after the decision to repower with GM Diesels, the new power plant took over the load. The Stewart & Stevenson installed power plant consisted of two GM Diesel quad units, each rated at 450 H.P. for continuous service, or a total combined rating of 900 horsepower. Maximum rating combined is 1200 H.P.

An interesting factor about the new GM Diesel installation is that the engines are equipped for *Dual Fuel* operation. They can be operated as *full Diesel* engines on either straight Diesel fuel oil or a combination of approximately 20% Diesel fuel and 80% natural gas. No adjustment or changing of the engine is required to switch from one fuel to the other. This arrangement insures the maximum in economical operation as the operator can take advantage of whatever fuel is cheaper, natural gas or Diesel fuel.

It will pay you to get the complete story of a Stewart & Stevenson guaranteed installation of GM diesels for your plant. When you install GM Diesel power, you are assured of long life, *lowest cost operation* and 24 hour service. When you deal with Stewart & Stevenson Services, you are assured of *competent engineering, full responsibility, parts and service* anytime, anywhere plus the *experience* gained through thousands of Diesel Engine applications in every industry and under every operating condition. Call us. We'll have our nearest representative give you the facts on your power problem without obligation.

3013

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GM DIESEL POWER

Main Office and Plant: 4516 Harrisburg Blvd., Houston 11, Texas. Phone WOodcrest 9691
Branches: Corpus Christi, Dallas, Lubbock, McAllen, Wichita Falls.
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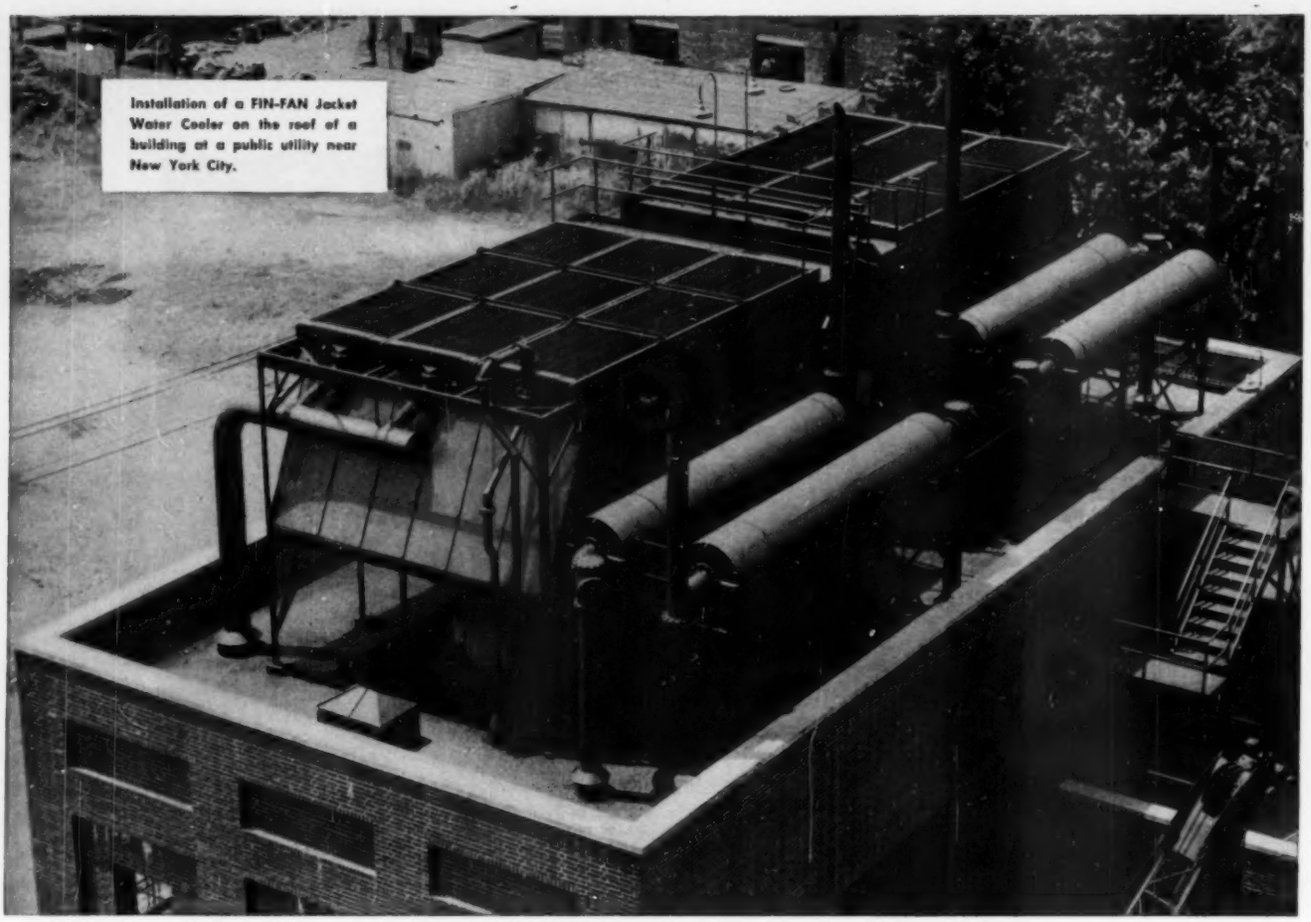
Distributors of: General Motors Diesel Engines, Continental Red Seal Engines, Chrysler Industrial and Marine Engines, Chicago Pneumatic Engines, Potter Diesel Engines, Gardner-Denver Pumps.
Fabricators of: Electric Power Units, Electrical Control Equipment, Portable Pumping Units, Truck Bodies, Hurricane Stalk Shredders.

PARTS... SERVICE

STEWART & STEVENSON SERVICES, Inc.

Anytime Anywhere

THE NATION'S LARGEST DISTRIBUTORS OF GM DIESEL ENGINES



Installation of a FIN-FAN Jacket Water Cooler on the roof of a building at a public utility near New York City.

Cool jacket water

the modern way with

FIN·FAN air cooled exchangers

You eliminate your water problems and expenses, and assure uniform year-round effective jacket-water cooling at least cost when you use FIN-FAN Coolers.

These compact air-cooled heat exchangers, developed jointly by Griscom-Russell and Fluor Corp. Ltd., have proven their many advantages for jacket water cooling in more than 100 installations using over 500 G-R K-Fin Sections as the cooling unit. They can be placed wherever convenient . . . on a roof, on the ground or within a building . . . and operate independent of the direction or velocity of the wind.

Write today for bulletin on FIN-FAN and for complete information on application to your own Diesel engines.

THE GRISCOM-RUSSELL CO. • 285 MADISON AVE., NEW YORK 17, N. Y.

Branch offices and Engineering Representatives in principal industrial cities

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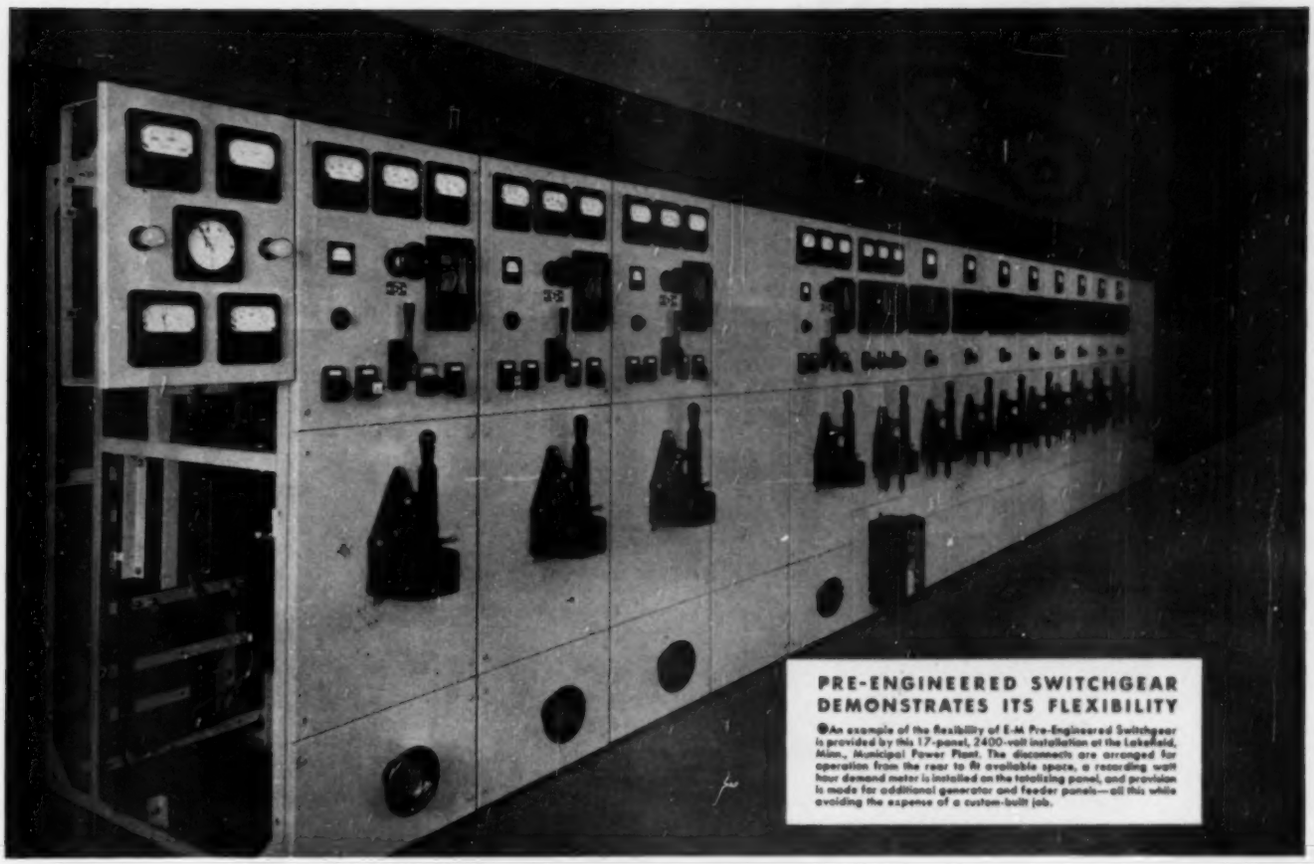
GRISCOM-RUSSELL

PIONEERS IN HEAT TRANSFER APPARATUS



PRE-ENGINEERED SWITCHGEAR DEMONSTRATES ITS FLEXIBILITY

●An example of the flexibility of E-M Pre-Engineered Switchgear is provided by this 17-panel, 2400-volt installation at the Lakefield, Minn., Municipal Power Plant. The disconnects are arranged for operation from the rear to fit available space, a recording watt hour demand meter is installed on the totalizing panel, and provision is made for additional generator and feeder panels—all this while avoiding the expense of a custom-built job.

All the Advantages of Custom-Built Generator Switchgear without the Extra Cost!

THERE are several ways to obtain switchgear.

You can go to the greater cost of having one custom-built.

You can select ready-made inflexible stock units that do not precisely meet all the individual requirements of your installation.

And the third way, the most satisfactory way, is to select a time-tested and field-proved E-M Pre-Engineered Switchgear.

For E-M Switchgear gives all these advantages . . . all components are pre-engineered and coordinated with each other. The gear is designed to provide switching protection for equipment and operators, metering, voltage regulation and for synchronizing generators. It is dead-front as our minimum and can be fully enclosed for even greater safety.

In addition E-M design provides a flexibility that permits additional meters or controls to meet peculiar needs.

This easy-to-buy, pre-engineered switchgear is a profitable, wise, modern choice. For full information, talk with your nearest E-M field engineer or write for specifications, panel outlines, and line diagrams of connections of basic units in Publication 194.

ELECTRIC MACHINERY MFG. COMPANY
MINNEAPOLIS 13, MINNESOTA

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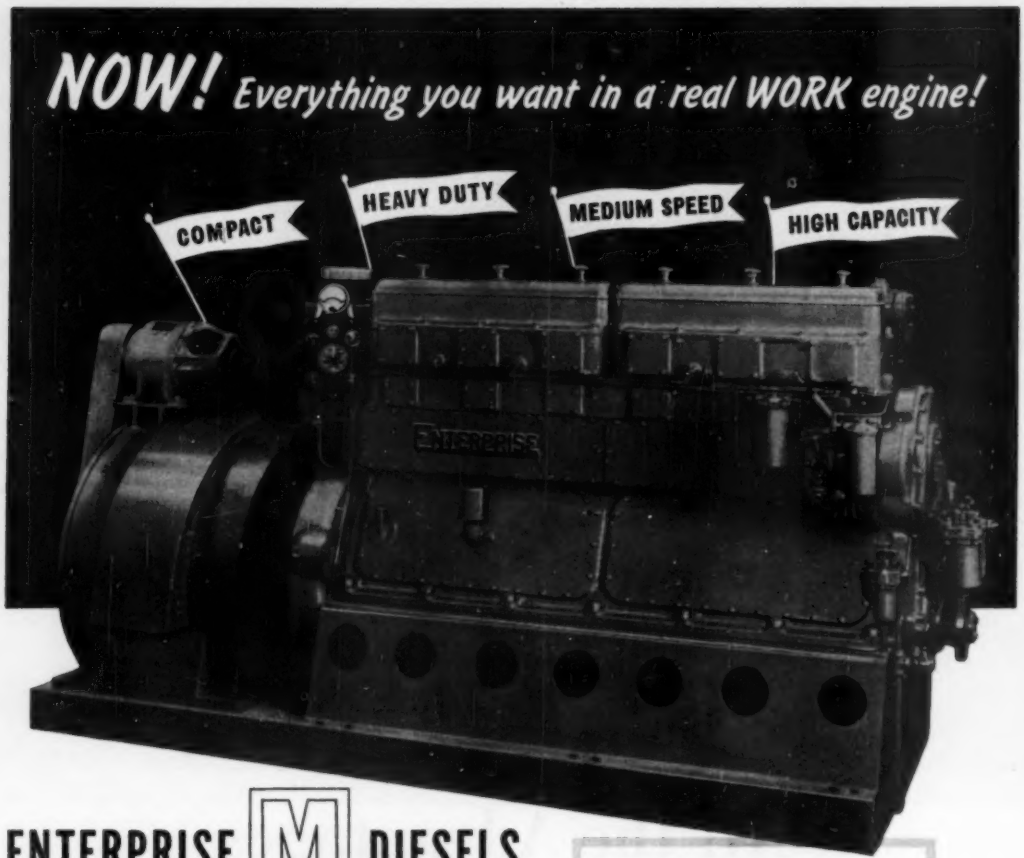
SPECIALISTS IN GENERATOR AND SWITCHGEAR ENGINEERING

NOW! Everything you want in a real WORK engine!



ENTERPRISE M SERIES DIESELS

Designed and developed to meet the demand for tough and continuous operation at medium speeds, Enterprise M Series Diesels in 3, 4 and 6 cylinder models are now available for the most economical solution to your power requirements using a wide range of low grade fuels. Compact, portable or completely contained if desired, these units deliver 68 to 240 BHP at conservative speeds of 450 to 750 RPM. They are WORK engines, capable of thousands of hours in demanding service, at low operating cost, with minimum maintenance and servicing requirements. When you compare, feature for feature, you're sure to make your next diesel a medium speed, high capacity Enterprise M engine—for years of the smoothest power you've ever enjoyed.

If you want 68 to 240 BHP, you'll get more for your money with an Enterprise 3, 4, or 6 cylinder M Series Diesel.

- 8" bore x 10" stroke
- Compact, medium speed, heavy duty
- Easy starting, air or electric
- Operates on low cost non-premium fuels
- Low fuel consumption
- Smooth, quiet, clean operation

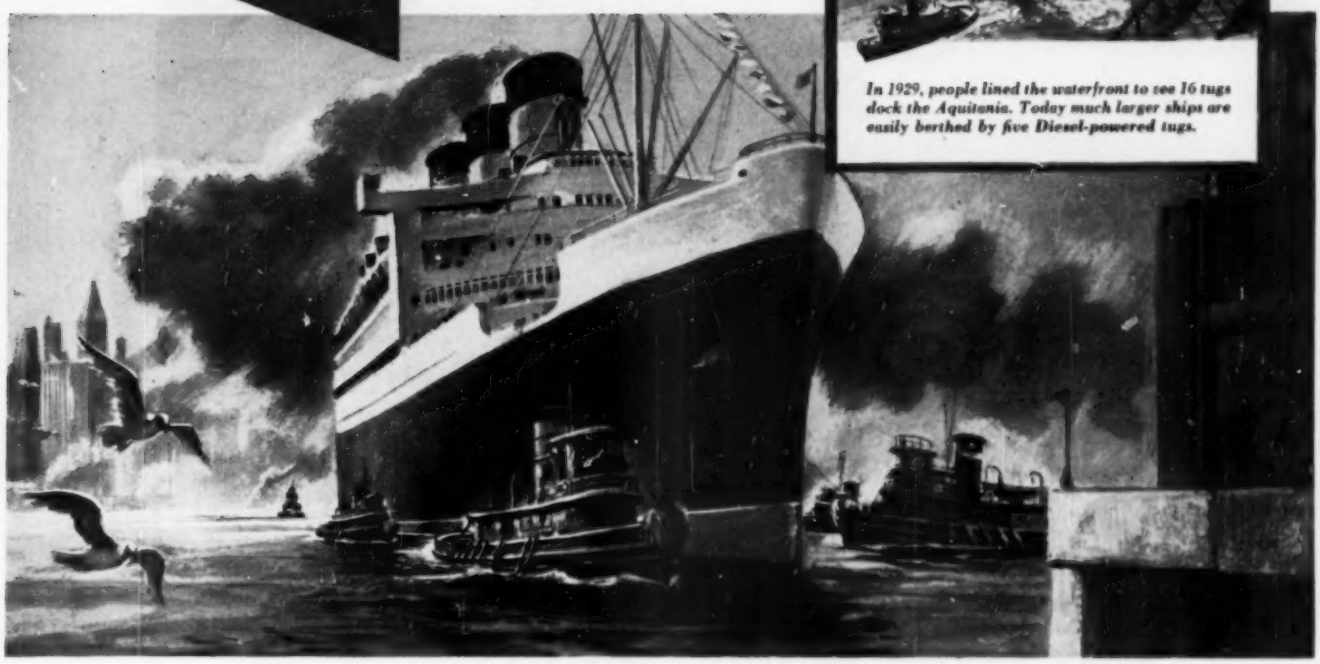
Enterprise STATIONARY Diesels

Write for new Enterprise M Series Bulletin No. M-16, or call your nearest Enterprise office for complete information.

ENTERPRISE ENGINE & MACHINERY CO.
A Subsidiary of General Metals Corporation
18th & Florida Streets, San Francisco 10, California • Offices in Principal Cities

What important thing was necessary to change THIS to THIS

In 1929, people lined the waterfront to see 16 tugs dock the Aquitania. Today much larger ships are easily berthed by five Diesel-powered tugs.



1. ***Development and Field Engineering.***

American Bosch engineering departments and laboratories work constantly to improve existing products, develop new ones such as the revolutionary single plunger multi-cylinder PSB Pump. Our field engineers work hand in hand with engine and equipment manufacturers — from original design to test models and actual field operation.

2. ***Precision Manufacture.***

The knowledge and craftsmanship that made solid fuel injection a reality . . . plus engineering research, proven techniques, unparalleled production and testing facilities (many of them initiated and developed here) . . . insure uniform adherence to the highest standards of accuracy and performance.

3. ***Service Organization.***

In many U.S. cities and at strategic points throughout the world, American Bosch maintains an ever-growing network of authorized service stations. Staffed by personnel trained to factory standards, with factory-designed and built testing equipment, they are prepared to render efficient and reliable service whenever needed.

Dependable Fuel Injection

Many things — and many men — have contributed to the progress of Diesel power. But one vital element necessary to make this efficient, economical source of power universally applicable was dependable solid fuel injection.

American Bosch was a pioneer and still is a leader, in this field . . . a position established and maintained by American Bosch development and field engineering, precision manufacture and its ever-expanding network of service agencies.

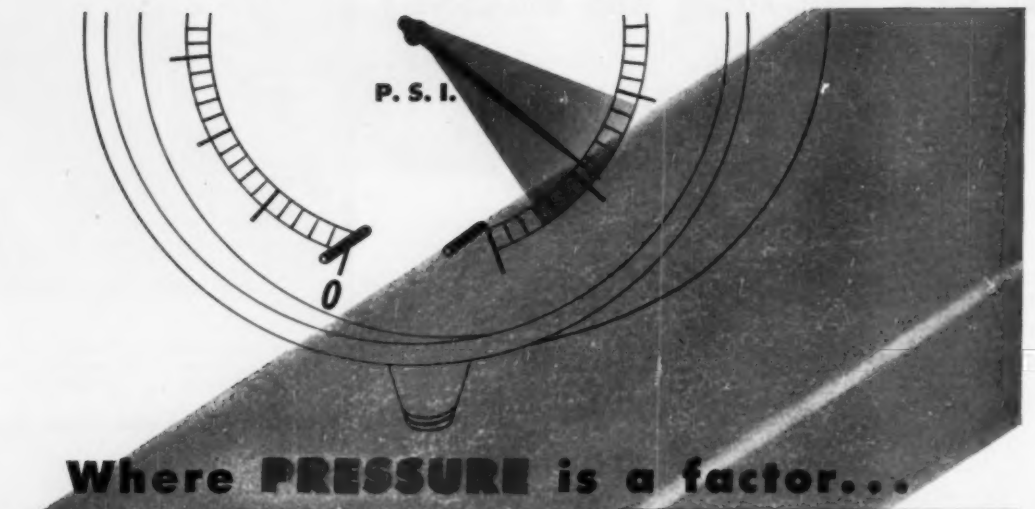
You can depend on premium performance when the fuel injection system bears the name American Bosch.

American Bosch

Dependable Fuel Injection for the Diesel Industry

AMERICAN BOSCH CORPORATION, SPRINGFIELD 7, MASS.

Magnetos • Generators • Voltage Regulators • Ignition Coils • Electric Windshield Wipers • Diesel Fuel Injection Equipment



Where PRESSURE is a factor...

GUN IRON CASTINGS

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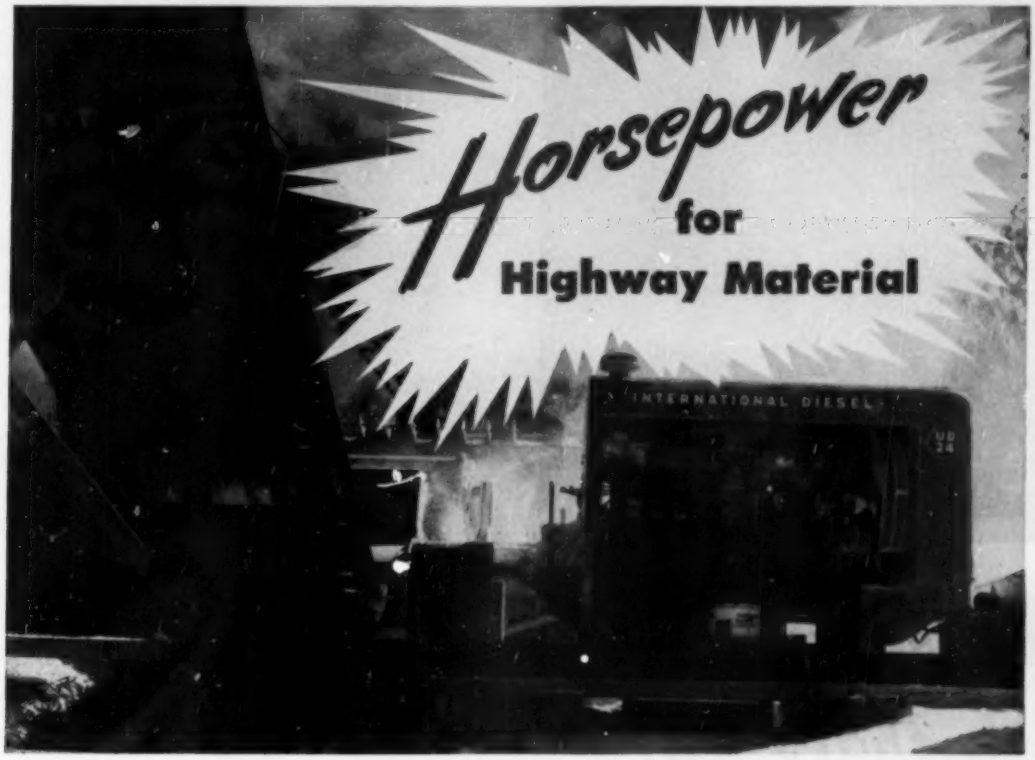

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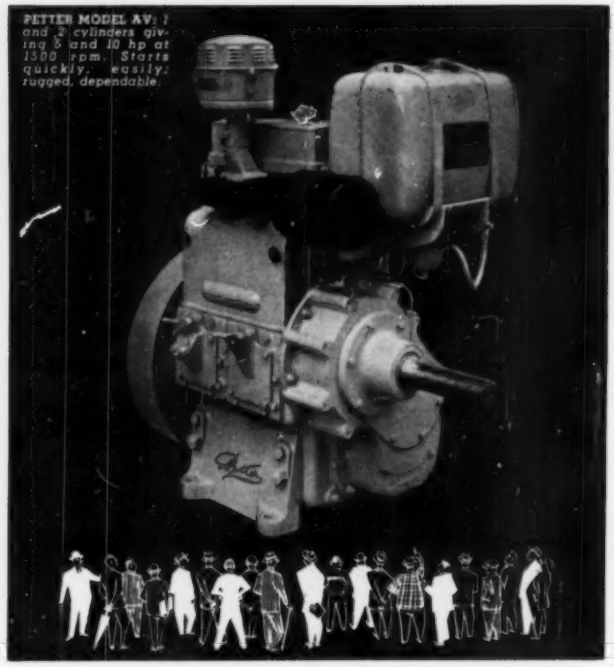
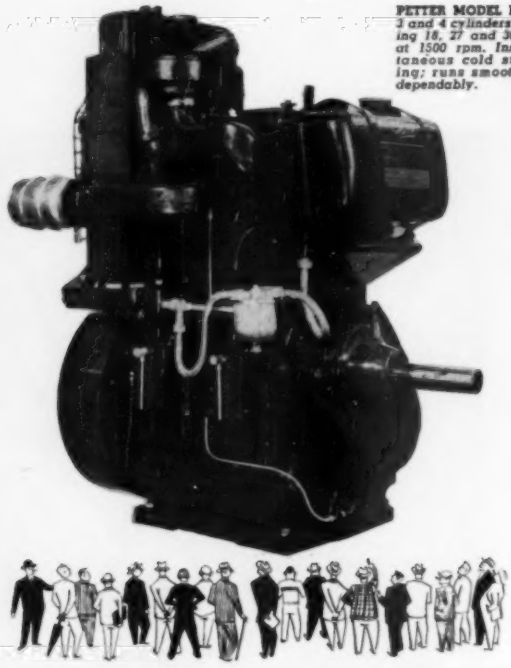


PETTER MODEL AV: 1 and 2 cylinders giving 5 and 10 hp at 1500 rpm. Starts quickly, easily; rugged, dependable.



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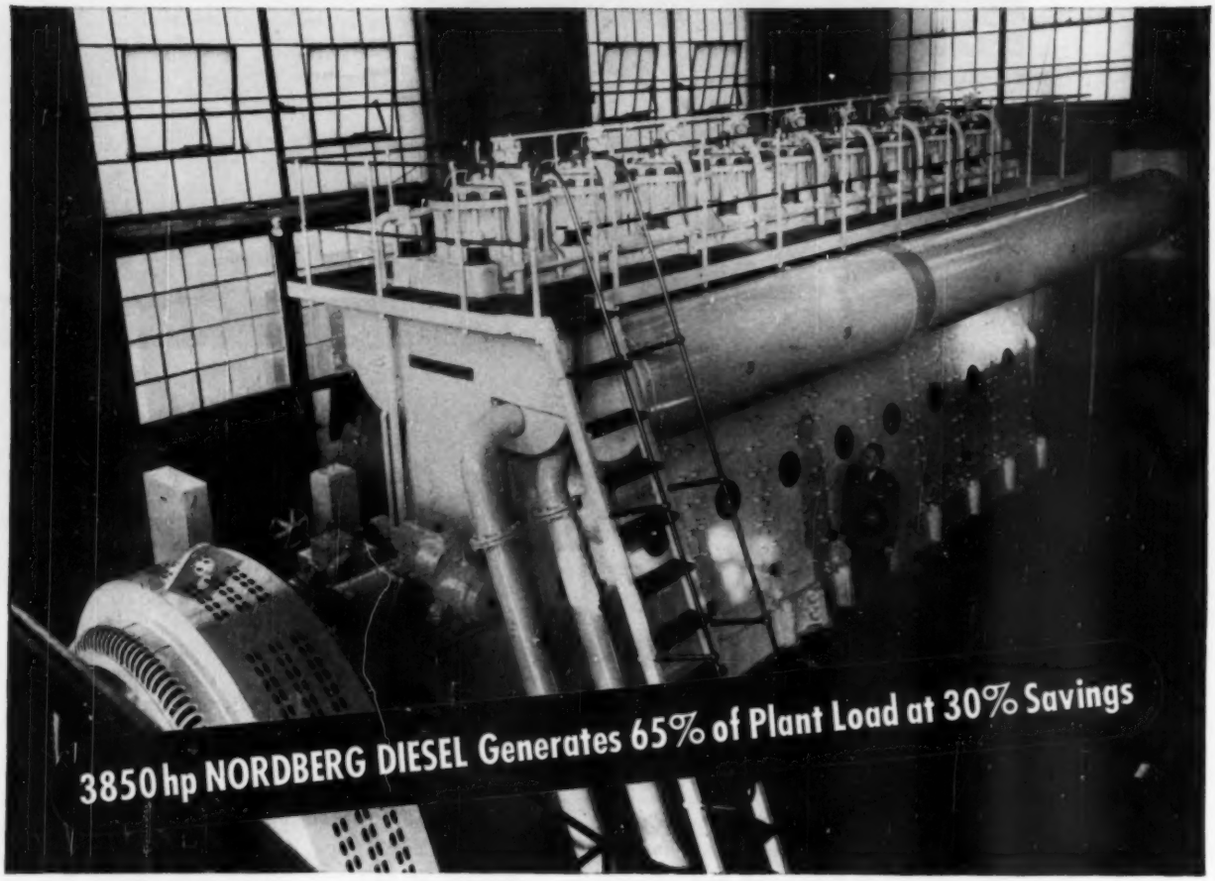

WITH the installation of this nine-cylinder 3850 hp Nordberg Diesel in the Village of Freeport, N.Y. light and power plant, and with a total capacity of 17,310 hp installed, this makes one of the largest municipally owned diesel-electric plants in the United States.

Usually the first few months of engine operation are used for break-in and adjustments, but in this case the new engine went right to work and established a number of plant performance records. In little more than five months, the diesel was in operation 3,386 hours, and made the longest continuous run of any engine in the plant.

Just before the Nordberg Diesel began its full-time operation, the plant's average cost per kwh, including fuel, lube oil, labor, maintenance, supplies, insurance, depreciation, and miscellaneous expenses, was 11.4 mills. The corresponding cost for the Nordberg unit is just 8 mills, a reduction of about 30%, and a figure set by Chief Engineer Thomas Moore as a goal for the entire plant.

During summer months, Freeport's load varies from a low of about 2,000 kw in the early morning hours to a peak of about 5,500 kw. Running alone, the big Nordberg handles the valley load nicely; when load rises, it continues to carry a relatively high percentage, which makes for operating convenience and efficiency. Mr. Moore estimates that this one engine is generating 65% of the plant's kwh production.

Here, then, is another good example of the way in which Nordberg Diesels, in sizes from 10 to 8500 hp are being used to solve municipal and industrial power generation problems. Write for details, outlining your requirements.

NORDBERG MFG. CO., Milwaukee 7, Wisconsin

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DIESEL ENGINES

--AND 'ITTLE LAMSIE-DINO!

By:- F. HAL HIGGINS.

Glenn County Farmers Grew $2,789,000 in Ladino Clover Seed, Pasture and Hay in 1949; 100,000 Acres of this Popular Legume Will Be Grown Soon.

GLENN County, California, is now in the midst of a farm boom that makes the wheat era of Dr. Glenn's days, as well as the '49 Gold Rush to the hills above, seem like a compound revival. The new "gold strike" is Ladino, an Italian immigrant that is really a droppy-headed white clover that has taken hold across the whole breadth and depth of the United States, excepting a few arid high temperature areas. In the irrigated areas of the West, Ladino is the ideal pasture crop. In spite of doubling and re-doubling of the seed crop during and since the war by Glenn County farmers in the Sacramento Valley, it has remained so much higher in price that it is the queen of the soil building seeds in an era of emphasis on soil building crops to rebuild worn and depleted farms from erosion and short-sighted cropping of past generations. "Ladino Seed in Short Supply" is the sub-head over an April, 1950, Production and Marketing Administration report. Says the P. M. A.: "Last year's seed crop of Ladino clover was the largest ever produced in this country, but it wasn't enough. Ladino seems to have become the nation's wonder crop. At any rate, its popularity in the West is rivaled by the New England States, where winners in the Green Pasture contests all used Ladino . . . and Southern farmers are now getting interested. More often than not, if a crop hits the figure that classes it as the largest ever produced, a surplus results. Not so with Ladino clover. State Committees have figured that farmers would use 9 million pounds of Ladino seed in 1950 if they could get it. Last year's crop was 3,390,000 lbs. of clean seed, not even half the possible demand. Ladino clover seed production is also being encouraged through price support. Only certified seed is eligible, since certification is the only way to be sure of its identity. Farmers should be sure they have ordered their Ladino seed requirements, and should use only certified seed."

The writer has been watching and studying the rise of this glamour clover crop for some fifteen years since first noting what it was doing for a farmer with a flock of sheep in Stanislaus County on a comparatively thin soil that wasn't regarded highly by the farmers of the rich delta lands west and north of Stockton. So, he has followed it up and especially checked the development in Glenn County at the grass roots as he watched the ingenious farmers work out special machines to get the elusive and precious seeds from stubble by means of vacuum harvesters, or "sucker-uppers," as the local builders immediately named them. It was Agricultural Commissioner P. V. Harrigan, of Glenn County, who first called your old reporter's attention to what was going on in his county.

"Glenn County is the largest Ladino clover producer in California," explained Harrigan in our first session on the subject at his office in Willows in 1945. "Ladino first came in here about 20 years ago," he explained. "But in 1945 it had jumped to 30,000 acres. In the earlier years there was a market problem because it was still an untried plant and the big national demand for it hadn't started. When this demand started, our farmers went into seed production. Then we organized the California Ladino Seed Growers' Association, with J. E. McDaniel president and Victor Hoag of Gridley as secretary. Joe McDaniel is our largest grower of Ladino, producing 25,000 pounds of seed last year. In addition to seed he handles 25,000 sheep on Ladino clover pasture. He is a big operator in sheep. With the introduction of Ladino, the livestock in the county has doubled as far as dairying is concerned, with some increase in sheep. We fatten our lambs from Oregon and other range sheep producing areas as a result of this fine pasture. Ladino and sheep on the land add a lot to the power of that land so handled, we find. The Association handles two-thirds of the seed, there being about 210 growers of seed now. But we figure the seed a secondary crop, as we need the Ladino clover for pasture. When we double the present acreage of Ladino we will come nearer our needs. The vacuum harvester built by George Fiack has solved the terrific losses of seed our growers took from not having any machines that would get anywhere near all of it. I figure I lost $5,000 in seed on my piece of Ladino before this vacuum harvester was invented and used here. The seed is so small and light that all the old methods of combining, windrowing, threshing by stationary thresher, etc., could get only a small percentage of it. The stubble was literally paved with gold when you figure the price at $1.75 to $2.25 a pound and good land was producing as high as 300 or more pounds per acre."

President McDaniel and son Gregg with County Agricultural Commissioner Harrigan watch a Ladino seed harvesting demonstration at their ranch near Willows.

Fiack's Ladino seed farming neighbors immediately began building their own versions of the "Sucker-Upper" to harvest their own clover seed crops for a big step-up in income. A diesel tractor is out in front pulling a Case combine with straw elevator that puts the combined Ladino hay into the trailer for a second threshing at headquarters. The vacuum harvester follows this outfit and gives the stubble a final vacuuming to get every possible seed shattered off the hay.

County Agricultural Commissioner Harrigan's 1949 annual report, published recently, really gives the present picture of a county sitting on top of the world of soil-building seeds as the nation's seed house for the most sought soil building and live stock pasturage crop of all. Ladino clover has increased to 55,000 acres, and is on its way to 100,000 acres in this county. Of this 8,500 acres were harvested for seed for a yield of 800,000 pounds, of which 60 per cent was certified. Certified seed is wanted by growers all over the map, of course, as they start with the new crop of soil building clover. Besides the 800,000 pounds of Ladino seed, valued at $1,144,000, there was $60,000 in Ladino hay. Ladino pasture was valued at $1,654,000. It produced lamb, wool, milk and beef. The ten-year value of Ladino seed for Glenn County adds up to an even $5,000,000, starting with only 49,600 pounds of seed in 1940 before the diesel-powered vacuum harvester of George Fiack was built to revolutionize the harvest of the elusive little seed that immediately became the "gold nuggets" that every farmer sought in the stubble of his Ladino fields at harvest time. As the writer drove into Willows recently to check up this lamb-Ladino story with County Agricultural Commissioner Harrigan on a day when the air over the Sacramento Valley was flecked with rice sowing planes as they rose, wheeled and maneuvered over flooded fields being seeded, he caught the famous official in a visitor-less moment, when he could slip away to guide the visitor over his domain and point out the doings in lambs and Ladino at this season. We drove out past the stockyards and turned east toward the famous rancho of the fabulous "Doc" Glenn, for whom the county was named a few years after his murder in 1883. "Let's see if President McDaniel is at home," said Harrigan. "He is not only the president of our Ladino seed association since it was organized, but is a big lamb feeder and a diesel tractor farmer, too. McDaniel has made a fine president for the seed growers' association, by the way, and the growers have had no inclination to change presidents since they were organized."

We drove past a bunch of fat Hereford beeves on Ladino pasture and on to the McDaniel ranch headquarters. No one at home except a shepherd helping load a truck with rams for a buyer. So, we crossed the road to a beautiful bunch of lambs feeding on Ladino pasture and snapped a camera at them. Then back to the ranch headquarters to shoot the Caterpillar D4 being serviced following its use at pulling an irrigation furrower for a new field of Ladino. A complete line of General Petroleum fuels, greases and oil for the farm equipment was stocked in a neat shaded home service station. On the opposite side of the road was glimpsed a bigger Cat diesel tractor pulling a disk harrow as it got a seedbed in order. On down the road we saw an HD10 Allis Chalmers with its two-cycle GM diesel purring along as it pulled a five-bottom Oliver plow set as deep as the hard adobe soil would take it. Wherever one looked or drove there were diesel tractors at work, unless the fields were already flooded for rice. International Harvester, Oliver (formerly Cletrac), Caterpillar and Allis-Chalmers were doing the heavy spring work that got the fields ready for the crops of rice, bar-

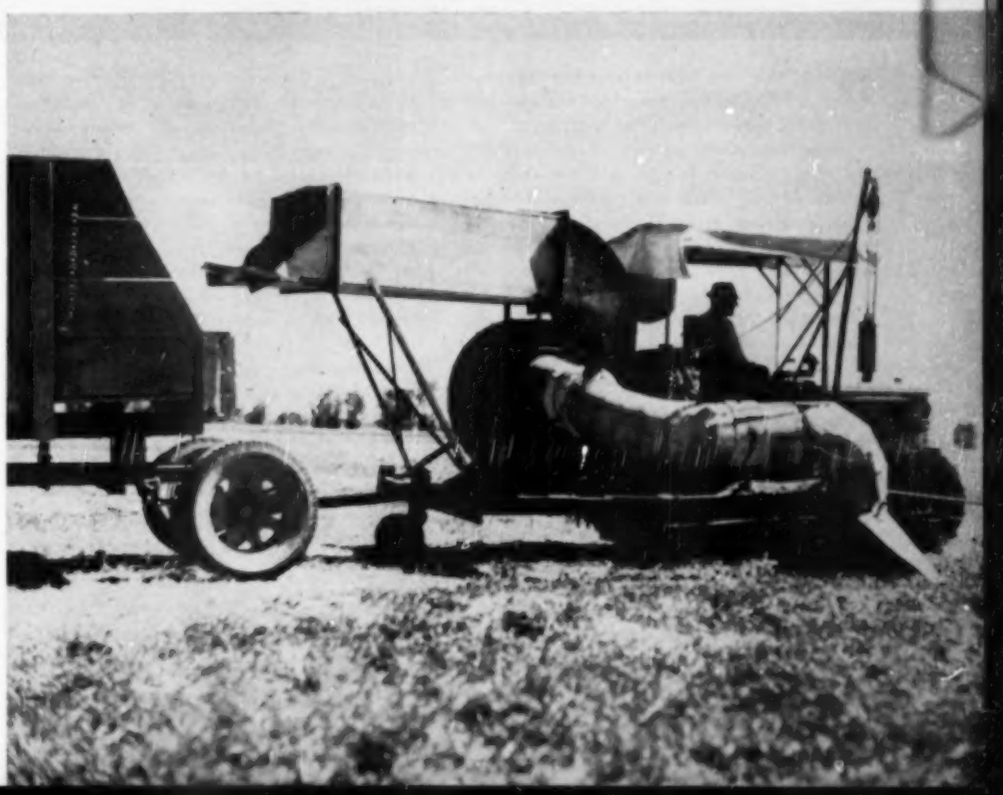
ley, Ladino or fallow fields that would be rested this year as grain and rice crops were restricted about 20 per cent on Government regulations. But the good land in good hands was going more and more to Ladino to take up this 20 per cent slack.

The main highway—99W—brings a flow of heavy diesel-powered trucks loaded with groceries, beer, steel, cement, lumber, oil in tankers, and all the various needs of the farm and town folks up and down the county through which the trucks shuttle between Seattle and Portland at the north end of the run to San Francisco on the south end. We pulled up at a little coffee shop and gas station opposite a big rice and grain elevator on the south edge of Glenn County. Your old reporter counted seven diesel trucks parked while the drivers lunched. He casually checked them over and found among the preponderance of Cummins-powered Kenworth, Peterbilts and Internationals, one fine big Kenworth with Buda engine. "How's that Buda doing?" the reporter asked the driver as he changed shoes while waiting for his driving partner. "It's o.k., and has 150,000 miles on it over the Sierras from Seattle to Montana and down from Seattle to San Francisco. Toughest run on the map," summarized the driver. More diesel trucks kept arriving and leaving. We counted 23 as we drove on down the highway to Woodland, scarcely 20 miles away. One can easily figure where the long haul heavy freight is going from here on if and when they build the roads to carry the freighting trucks and the auto traffic fighting for a foothold on the same overcrowded highways, streets and bridges.

The origin of Ladino clover is not definitely known. It comes from Italy, having been known in the upper valley of the Po for over fifty years, and is thought to have developed by a slow process of natural selection from the white Dutch clover. Seed for trial in this country was first secured by the United States Department of Agriculture in 1903. These early tests were made in the eastern states and proved unsatisfactory, for the crop failed to set seed. Tests were again made in 1911, this time in Idaho, which were successful. Good crops of forage and seed were produced. Commercial seed production was begun in 1918, at which time field plantings were made in southern Idaho. The earliest recorded planting of Ladino clover in California was made in 1921 by Mr. William Harrison, then Farm Advisor of Yuba County. Seed for this planting was secured from the United States Department of Agriculture, Washington, D. C. In 1923 John Tomasella, of Orland, Glenn County, secured Ladino-clover seed from Italy and sowed it in a thin stand of alfalfa. For ten years this planting provided excellent pasture in spite of the competition from Bermuda grass. From 1925 to 1929, a few additional trials were made in various parts of the state. The most notable of these was a planting made on very shallow soil belonging to Mr. A. Miedeck, of Galt, Sacramento County. Because of the large yields of forage produced as compared with yields secured from other forage crops grown on the same land, the results of this planting were widely published, and served as a stimulus for numerous trials in widely scattered areas of the state.—Calif. Agricultural Extension Circular 81.

Eureka! Grass Roots Gold! Here is George Fiack, Glenn County farmer, who got an idea from his wife's vacuum sweeper and built the first "Sucker-Upper" to harvest the shattered Ladino seed lost in the stubble. With his trusty International TD9 diesel tractor as power, he hung on a blower reversed to suck instead of blow, and took $38,000 in Ladino seed from his neighbor's stubble on a 50-50 basis after they were through harvesting by old methods.

Profile of a diesel driver with an idea that brought millions to Glenn County Ladino seed growers in the past seven years. George Fiack on his International TD9 with his "first edition" "Sucker-Upper" at work on his Ladino stubble. Next year he improved design for more efficient seed harvest. Michigan State College, little welding shops over the Sacramento Valley, and a big mid-West manufacturer, as well as Fiack's neighbors, have all copied idea in varying styles and sizes.



"H. W. McCURDY"
A NEW DIESEL-ELECTRIC DREDGE

Most Powerful 24-Inch Suction Dredge

By [illegible]

DESIGNED and built to continue the huge task of dredging a channel 300 feet wide and 30-40 feet deep in Alaska's famed Wrangell Narrows, the trim, almost streamlined dredge *H. W. McCurdy* left Seattle July 20. The new dredge is a result of some of the most ingenious planning, engineering and research ever undertaken in building a vessel of this kind, and she will be operated under contract to the U. S. Engineers by the same people who "dreamed her up," Puget Sound Bridge & Dredging Company, one of the largest of its kind in the U. S. A., and largest on the Pacific Coast.

Puget Sound Bridge & Dredging Company has had vast experience in heavy engineering and shipbuilding for almost 75 years, and at one time helped change the entire map of the East Bay area of San Francisco Bay, including what is now the fill and lake in the heart of Oakland. In the last war they operated a large specialty shipyard and at present are reconverting, or un-mothballing, Victory ships for the current Korean war. *H. W. McCurdy* was named after the company president, and is the largest 24-inch suction dredge ever built. It is of welded steel construction throughout, with all frills, projections and surplus exterior trappings shorn away to a bare hull, a long ladder, and a deck house for day or shift use only, with a control room unlike almost any other dredge ever built, centering its lever control system in an elaborate Westinghouse pneumatic control system that, with variable air pressure, simulated lever action on the cutter, maneuvering sidewise and ahead or astern, without fatigue of the operator.

Consulting engineers on the whole job were the Kenworthy-Vonhoff organization of Seattle, who ingeniously put together the completely rebuilt power plant and designed it to operate continuously at full loads in the heart of city industrial waterways, rivers or in remote regions where no power is available. A separate hotel barge and service tug complements the dredge for operation in wild territory.

The hull is 145 feet by 44 feet by 9 feet, with 6-foot loaded draft. Total displacement at full load is 1,146 tons. The big fabricated ladder, carrying the cutter motor and reduction gear, shafting, cutter wheel and suction pipe is 78 feet long and weighs 90 tons. The spuds are 1½-inch silicon steel welded to 32-inch diameter and 72 feet long, weighing 20 tons each.

With this long ladder and deep spuds, the dredge can work anything from fine sand to 18-inch granite boulders, up to 50-foot channel depth and 300-foot channel width without resetting the anchor gear. The engine compartment starts off with the elaborate winding gear placed on the main deck level just inside the forward bulkhead, and close to the ladder. Tank capacity is divided into two of 15,800 gallons capacity for diesel oil; one day tank of 1,800 gallons and a lube oil tank of 2,000 gallons capacity, plus fresh water tank capacity for 3,000 gallons. A special tank barge will serve the dredge where necessary, or where local fuel distribution facilities are limited.

The giant 13-foot dredge pump occupies the space next in from the winding gear flat, and it is

driven by a 2,500-hp. General Electric 2,300-volt A.C. 257 rpm. induction motor, direct connected to the pump. A 20 per cent speed variation is possible through a huge liquid rheostat, the tanks of which are mounted with openings on the upper deck. Soda solution is used, with automatic make-up of fresh water and a heat exchanger to cool the circulated brine automatically, with salt water. The diesel power plant occupies scarcely the same space as two boilers on an old-fashioned steam dredge. It comprises two Fairbanks-Morse 38D8 10-cylinder, opposed piston diesels, each driving a 1,420-kva., 2,300-volt alternator. Output of each diesel is rated at 1,600-hp. Next is a DSG6 Enterprise diesel of 650-hp. driving a 410-kw., 250-volt D.C. Westinghouse generator to supply, normally, the D.C. power for the cutter driving motor. A fourth diesel, a General Motors 3-cylinder 268A, drives a 100-kw., 440-volt A.C. generator to supply 440-volt A.C. power for pumps, lighting and general service purposes.

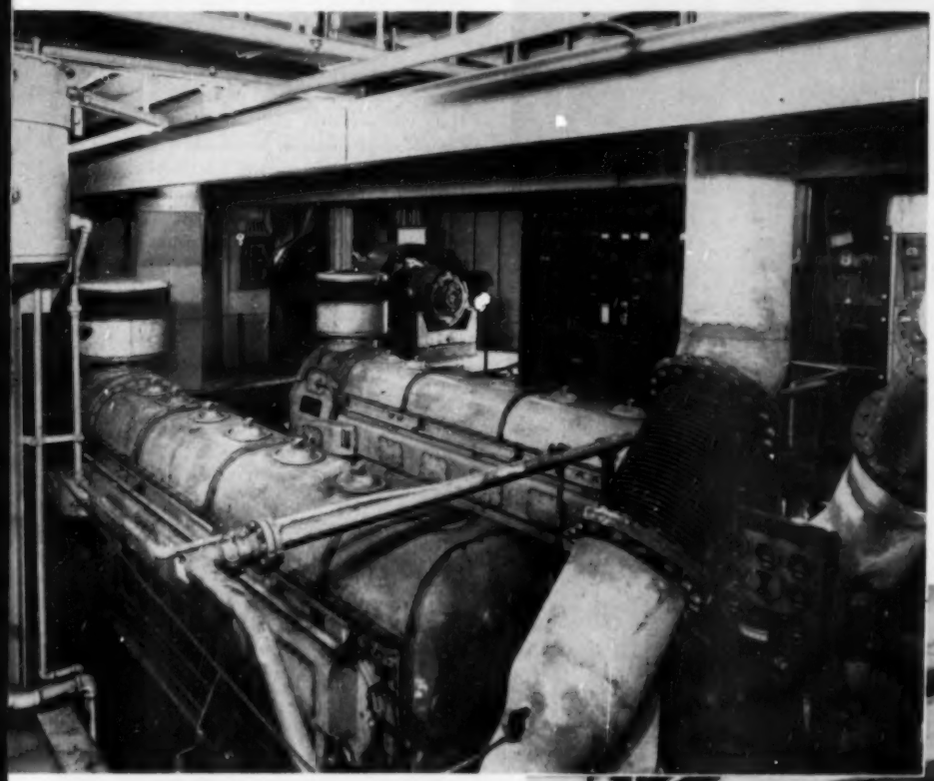
Most interesting and ingenious engineering aspects are to be found in the unique method of tying all these power plants together, each with separate voltages. A 410-kw. Westinghouse motor-generator set is fitted to supply power to the 250-volt cutter motor drive, and a second motor generator set supplying 250-volt current, for the winding gear drive, rated at 250 volts at 575 rpm., and delivering 150 kw. of power. The third tie-in unit will be a giant transformer, receiving shore power in eight high voltages, and by means of taps supplying the main pump induction motor at 2,300 volts, the motor generator sets and all 220 and 440-volt A.C. circuits for pumps, lights, and all other A.C. power aboard the dredge.

Thus either one F.-M. and the Enterprise, or all three, or the two F.-M. diesels, can be turned to supply power to the suction pump. The large motor generator set can convert the 250-volt D.C. output of the Enterprise unit to 2,300-volt A.C. The combination will supply 250-volt D.C. current off of the 2,300-volt A.C. pair of F.-M. generating sets, or direct from the Enterprise. Likewise, it will substitute for the 440-volt A.C. G.M. set when hooked up to a shore cable. Thus the inherent compactness of the modern diesel generating plant will complement the lower cost of central station power when working near shore transmission lines.

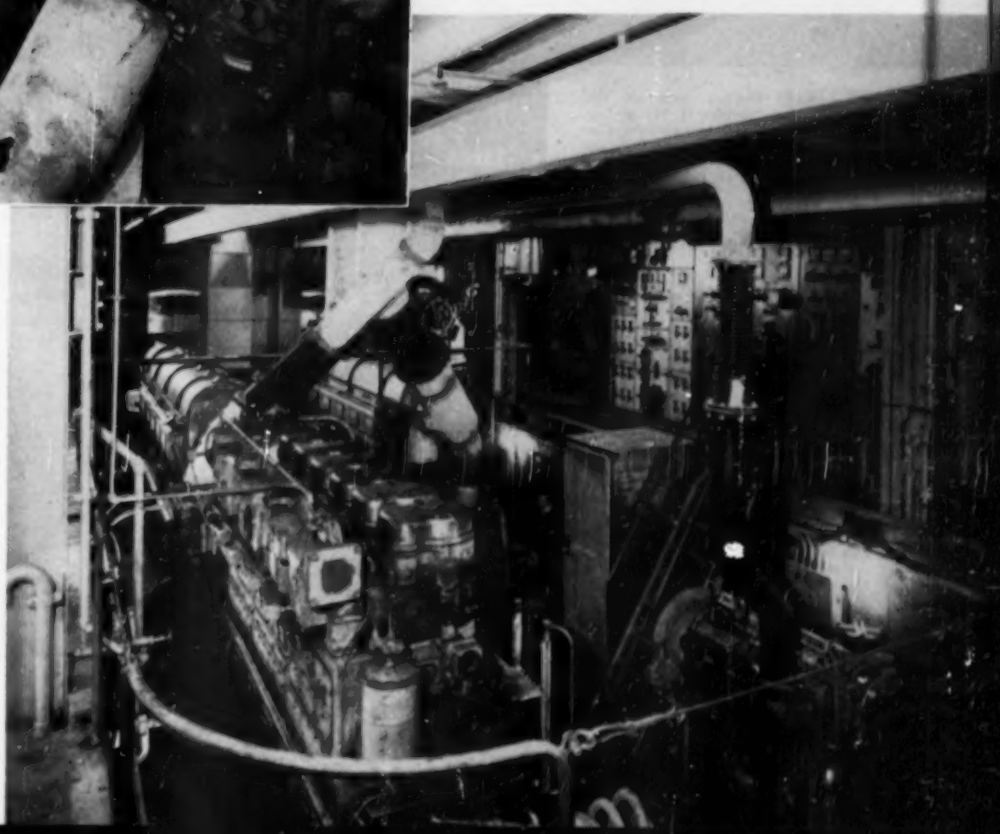
When quantities involving keeping the dredge running up to two years on a single job, with 4,000 horsepower of continuous load to figure costs on, bidding on jobs that can be figured against either the cheaper central station power or the "Go-Everywhere" diesel generated power, great range of use for this dredge is possible. In the Pacific Northwest, where central station power can be had for 5 mills per kilowatt, the ingenious multiple electrical system on the *H. W. McCurdy* will pay off the vastly greater initial investment.

The cutter is powered with a 515-hp., 250-volt Westinghouse D.C. motor, turning at 1,440 rpm., with full variable speed control through a Ward Leonard variable voltage control. This drives through a Waldron flexible coupling, with SKF bearings, and a specially designed Western Gear Works reduction gear. The main shaft runs through the center of the ladder on plain bearings. The motor and gear occupy a small steel housing at the foot of the ladder, supplied by rubbed covered cables. The vessel requires some 40 motors of various kinds, and carries Fairbanks-Morse pumps, and a fifth diesel to drive the Gardner-Denver fire and bilge emergency pumps and emergency air compressors for starting the vessel cold and giving the main diesel engines a dead-stop start after layups. A 150-lb. Worthington air compressor is fitted to supply air for the pneumatic control system and two 600-lb. pressure Worthington air compressors are fitted for diesel starting air. Three Fairbanks-Morse pumps are carried. The emergency diesel is a 6-cylinde Buda unit.

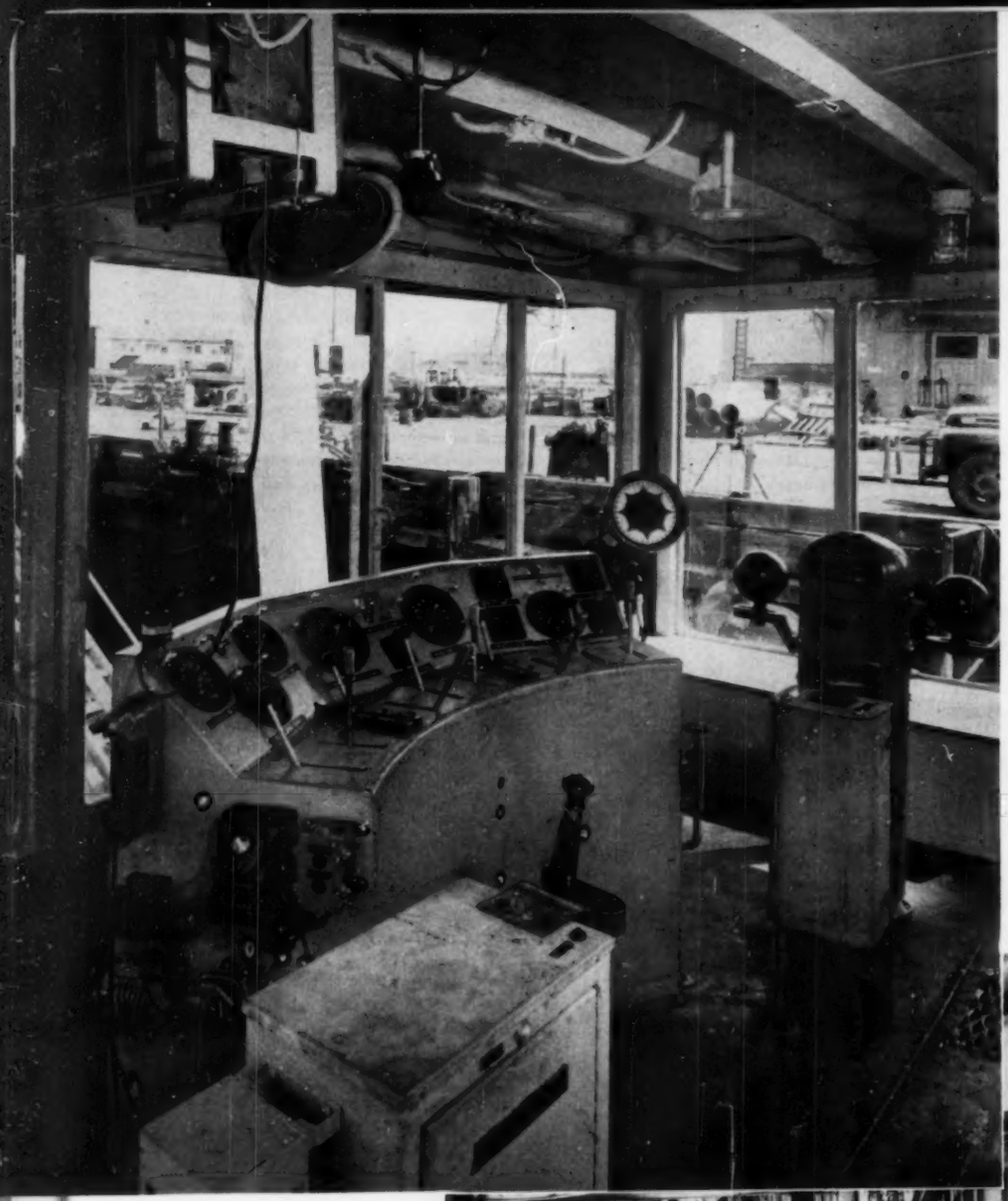
A Tierney Electrical Mfg. Co. switchboard, nearly 25 feet long, is carried on the machinery flat above the diesel wells. The elaborate winding gear is really a five-drum logging hoist, and is powered with a 200-hp. Crocker-Wheeler 250-volt D.C. motor with full speed control through a Ward-Leon-



Looking down on the two Fairbanks-Morse opposed piston diesels in the dredge *H. W. McCurdy*.



Another view of the *H. W. McCurdy* engine room showing the G. M. diesel in right foreground and the big Enterprise to the left.

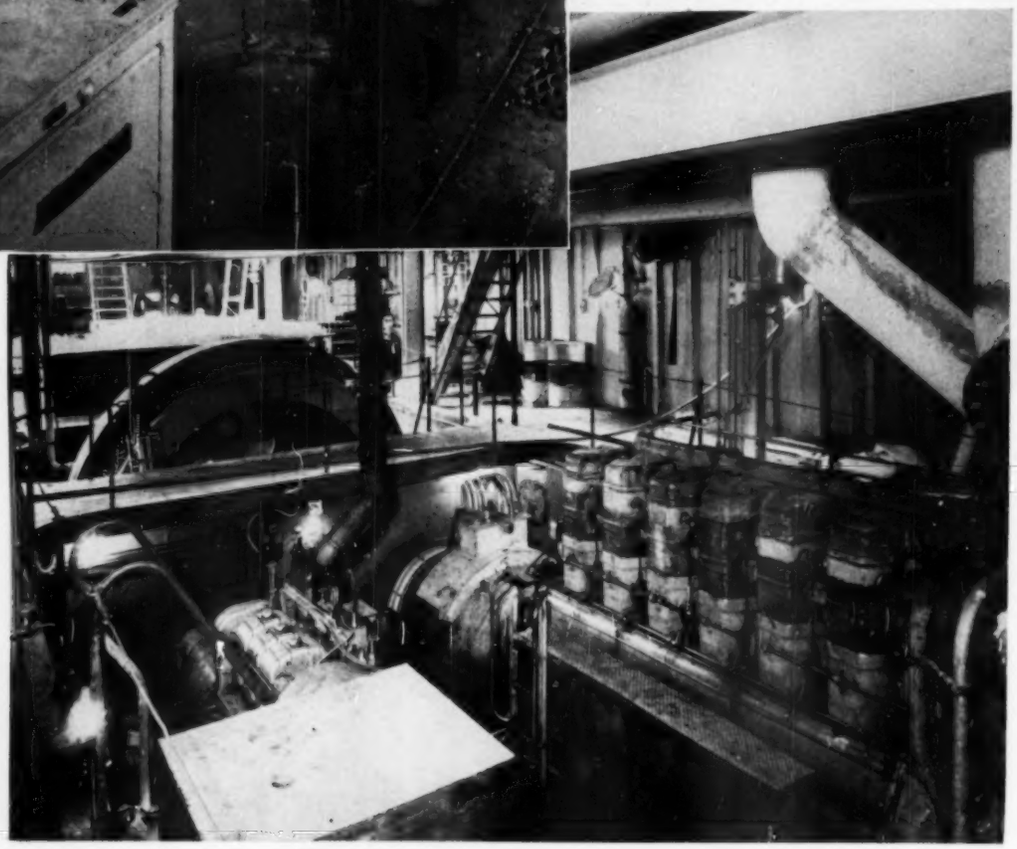


Leverman's control room on the diesel-electric dredge *H. W. McCurdy*. Four separate intercommunicating units are used—all controls are pneumatic. A short wave radio is a necessity on this ship.

ard control system. Delicate maneuvering of the dredging end of the ship is possible through this one single winch, controlled from the operating room (pilot house) from the main leverboard. The leverman is the big boss on a dredge, and his quarters are unique and unlike anything seen on a dredge before.

Other facilities and equipment aboard this unusual dredge include a Gyro compass and course recorder that charts the bottom of the channel being dredged. A ward room for the crew is all that is needed for quarters on this type of a dredge, with refrigeration and locker space and an electric range to facilitate lunches. A crew of eight per shift is carried, and it is set up to work 24 hours per day, six days per week, with repairs and servicing done on Sundays. The main dredge pump has 29-inch suction and 24-inch discharge, and a 105-inch impeller of special tough steel, and operates at a maximum speed of 257 rpm.

Officers of Puget Sound Bridge & Dredging Company are H. W. McCurdy, president; Raymond J. Hull, vice president and secretary; Marquand S. Gorton, chief engineer; Kenworthy-Vonhof, of Seattle, consulting electric and machinery engineers; Harry McLaughlin, yard superintendent and hull supervisor; and W. R. La Stadius, purchasing agent. After the long tow to Wrangell Narrows, the *H. W. McCurdy* will complete a second six miles of digging on these treacherous waters, busiest inland waterway on the Pacific Coast, in the heart of the Inside Passage from Puget Sound to Alaska.



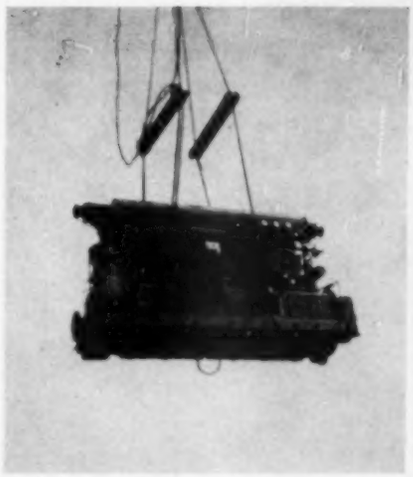
General Motors auxiliary diesel generating set in left foreground. Six-cylinder Enterprise diesel to the right. This is an extremely compact engine room for the amount of machinery installed.

RE-POWERED FOR EFFICIENCY AND SPEED

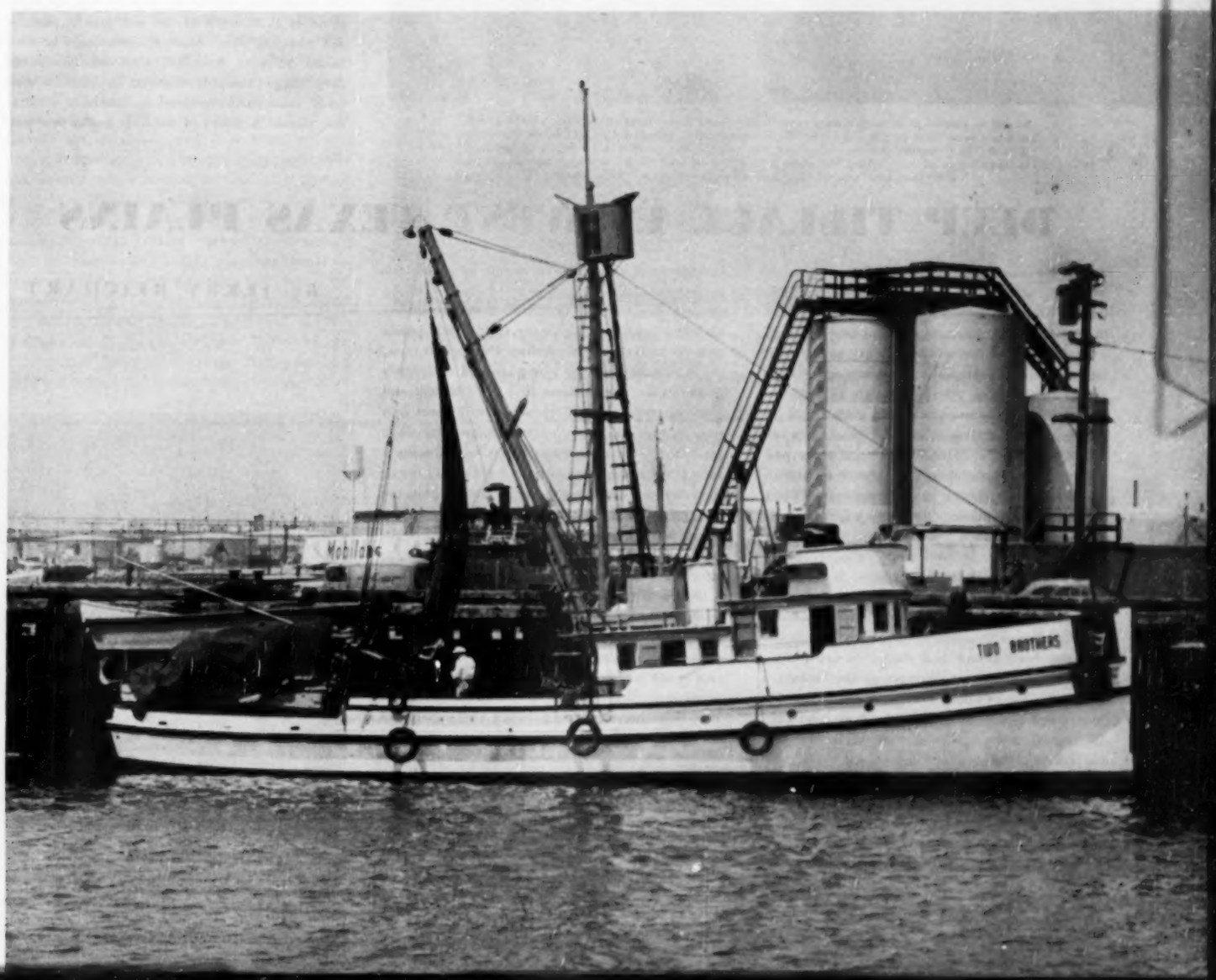
By ALFRED A. DeCICCO

COMPLETELY re-powered for speed and efficiency, the fishing vessel *Two Brothers* has re-entered the fishing fleet at San Pedro. This vessel underwent a severe ocean collision one day last January in a heavy fog, which resulted in making her source of power inadequate for competitive and profitable commercial fishing.

Due to the misadventure, John Yelusich and son, owners of *Two Brothers*, decided to install all new equipment on the craft and started by purchasing a 6-cylinder Union diesel held to 200-hp. at 500-rpm.—plenty of horsepower in reserve if more needed. Her cruising speed is ten knots. A compact, rugged engine, the Union diesel has made the Yelusich family more than satisfied with its performance as it has met every requirement that is demanded of engine drive in the fishing industry. The engine is air starting and is direct drive to the propeller shaft. Electricity for the entire ship is supplied by Gould storage batteries. Fuel supply from the 2,700-gallon fuel storage tank is filtered and strained through Winslow and Purolator filters. There are duplex Winslow filters for the lube oil. The meticulous installation of the diesel engine was handled by the Johnson Western Company, and the new equipment was installed by the Harbor Boat Building Company's skilled workmen.



The *Two Brothers* fishes mainly for sardines and is equipped to handle as much as 90 tons of this canned food. John Yelusich, with a crew of ten, captains her for two to three days on water and then returns to Fisherman's Wharf to unload his catch. The *Two Brothers*' 74-foot length, 18-foot width and 8-foot depth keeps her in the larger class of fishing vessels and with the new diesel installed, she is able to keep abreast with the fastest craft of her size in San Pedro.



Depth of furrow after deep tillage is well illustrated here. Both front wheels are steered and are controlled by the hitch, the tilt to both furrow wheels comes out when the plow is raised to transport position; the front and rear of the plow may be raised or lowered independently of each other; the plow is so balanced that under ordinary circumstances the front and rear of the plow will raise together, if so desired.

Texas, who tried various types of moldboard plows in endeavoring to find an answer to the farmers' needs with deep plowing. West Texas Equipment Co., through cooperation with Caterpillar Tractor Co., found that moldboard plows would not scour properly in all types of clay soil, and in place, a disk plow on which blade scrapers could be used would be most desirable. This attempt toward deep tillage prompted engineers to contact a West Coast manufacturing company, producer of large disc plows. A model of the largest plow was pur-

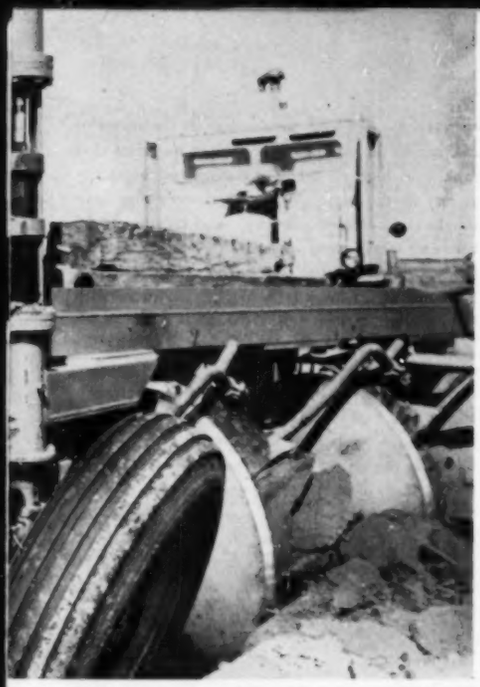
DEEP TILLAGE IN WEST TEXAS PLAINS

By JERRY REICHART

IN THE vast West Texas plains heavily laden from the great dust bowl havoc of 1933-36, farmers are now practicing a deep tillage method that is stabilizing the sandy soil and offering them a "one-seed" crop that will harvest and not necessitate replanting from continued drought and high windstorms. Today, driving through Terry, Dawson, and Lynn Counties, one finds evidence of an amazing transfiguration of the once desolate, wind-blown sandy fields. Many of the farms never producing more than 600 or 700 pounds of Martin maize per acre each year are now producing 1,500-2,800 pounds annually. In every case, the first years' increased production has more than paid the cost of breaking the land, aside from savings in seed and labor. With deep tillage, it has been estimated that in the South Plains area from 4 to 5 million acres of sandy low-productive soil can be transformed into highly productive farms. It has also been shown that farms receiving deep tillage have made the difference to the farmer in having no crop or bumper crop without the gamble of replanting 4 to 5 times to no avail, and then hoping for some type of harvest in late seeding of Martin maize.

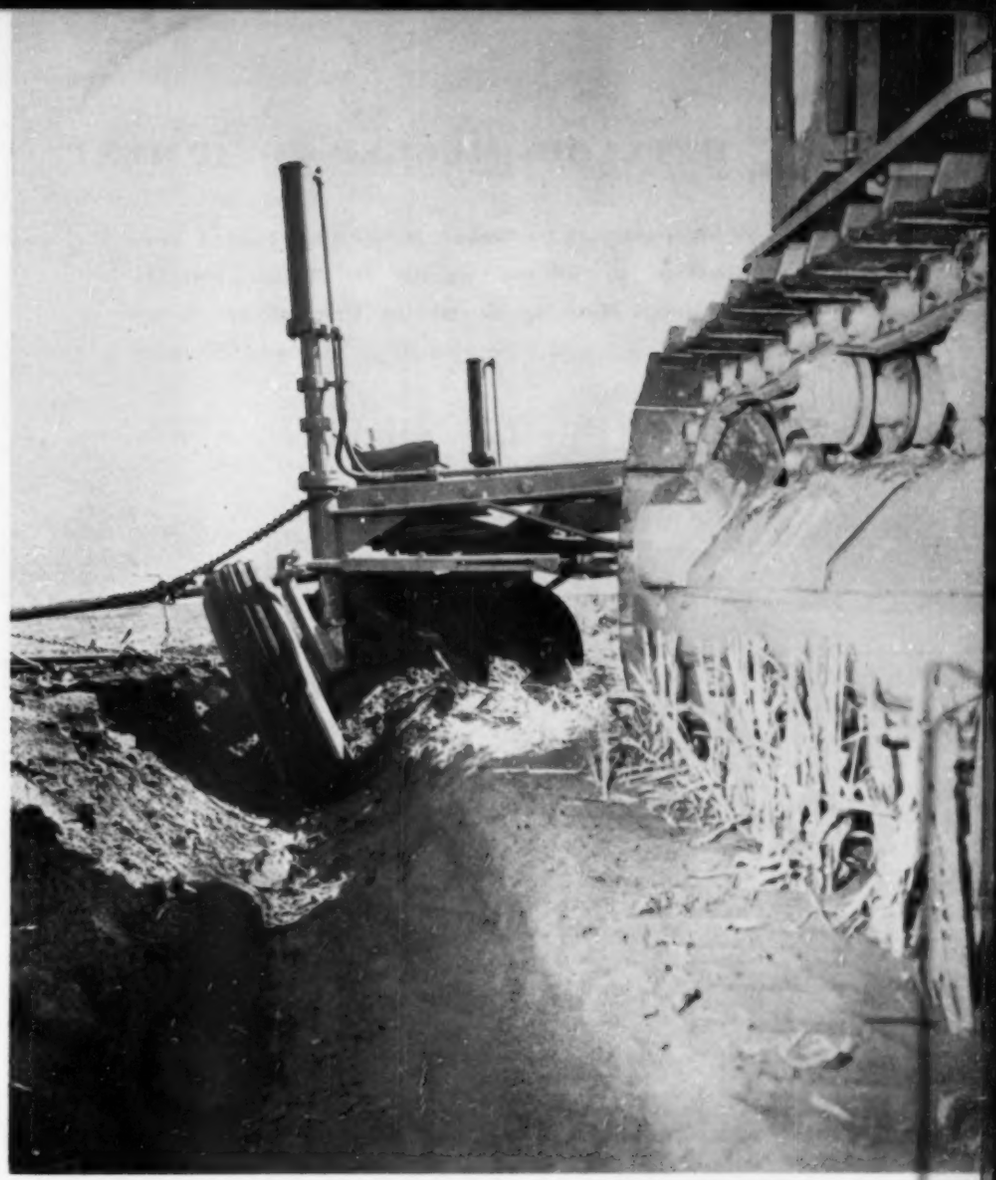
Ever since this area has been under tillage, the farmer has had to reckon with the problem of sandy soil blowing through his fields and resulting in damage or complete elimination of crops such as cotton, sorghum, grains and wheat. During spring, when crops are still young, the farmer has his worst headaches, for in the spring these plains bear the brunt of blowing sand. During this blow, the sand either cuts the young crop off completely or buries it. The problem then is to replant and quite often planting is repeated 5 to 6 times in a dire attempt to get crop stand. Even after these replantings, the sand has taken its toll. Usually a farm that has tried replantings of wheat will switch to cotton the following spring. If cotton planting fails he may try sorghum, but at this stage in the game, he is lucky to get even a small yield. Such trials must have an answer, and the men fighting against odds realized that this blow sand, averaging a 12-inch depth, will vary from 0-25 inches deep in covering the strata of clay soil. This concentrated and deep sand layer would have to be tilled over with a deep tillage tool capable of bringing the clay to the surface, thereby stabilizing the soil, thus preventing further blowing. It was also realized that in employing a deep tillage tool capable of doing such rugged plowing, a larger horsepower tractor was needed than the conventional farm wheel tractor.

Pioneer in this experimentation was West Texas Equipment Co., Caterpillar dealer in Lubbock,

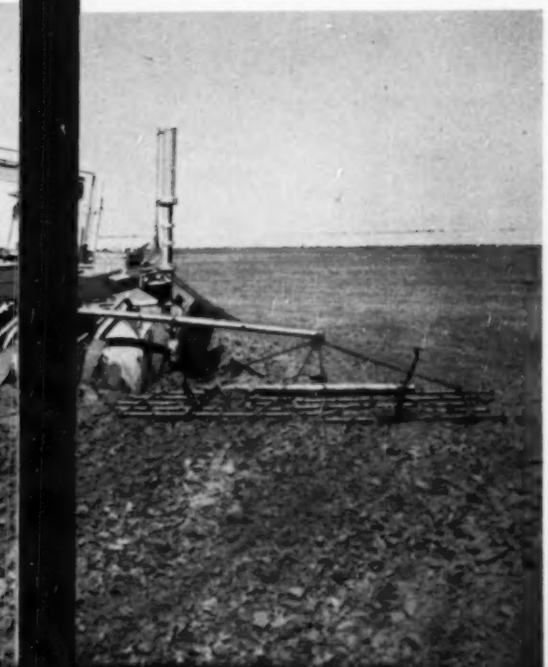


Left to right: C. W. Nance, West Texas Equipment Company, Lubbock, Texas, and operator O. B. Wilson. Note closeup of lifting mechanism . . . one of two 5x24-inch hydraulic rams operating on 450 psi. for a total thrust of 4½ tons per cylinder.

chased, equipped with 38-inch disk blades, and weighing approximately 4,000 pounds. Though not satisfactory, it did prove that the disk, and not the moldboard, was the answer to deep tillage. As a result, the plow was redesigned and its weight increased to 6,000 pounds. However, even this change was not satisfactory, as the tool was still too light and not strong enough to properly offer the desired tillage needed. In the latter part of 1947, West Texas Equipment Company then contacted Towner Manufacturing Co., Santa Ana, California, which became interested in designing and building a deep tillage plow specifically to meet this problem. After two years of intense experimentation and engineering, Towner produced the present Towner Model BP 44 Hydraulic Controlled Disk Plow. Powering the Model BP 44, "Caterpillar" Diesel D8 track-type tractors took the lead and proved the tremendous power needed in employing deep tillage methods such as experienced with the Towner disk plow.



Jude Taylor's unit is pictured here 3-bottom breaking . . . front wheels are steered and are controlled by the hitch; the plow can be converted to a four-standard plow or three-standard (as shown here) by removal of one or two blades, thus permitting deeper plowing with the same horsepower or to permit 24-inch plowing with less horsepower.



Rounding the turn on sand-blown maize field, this Towner Giant Disk Plow powered by a Caterpillar diesel D8 tractor is bringing to the surface the rich clay soil beneath, mixing it with the sand and stabilizing the soil, thus preventing further blowing. With this deep tillage method it has been estimated that in the South Plains area of Texas from 4 to 5 million acres of sandy low-productive soil can be transformed into highly productive farms.

Some results of deep tillage have already been recognized by the farmers bringing back the harvest to the West Texas plains: (1) It was no longer necessary for a repeated planting cycle . . . only one planting and elimination of the high cost of previous planting and labor; (2) Crop cultivation is practically unnecessary, due to weed and grass seeds being buried so deep that they cannot germinate. The saving in cultivating cotton crops alone will more than offset the cost of deep plowing to the farmer the first year; (3) It is estimated that deep tillage replowing will not be necessary for more than a decade; (4) Land formerly offered for $10-$12 per acre has increased in value to $30-$35 per acre on the strength of possibilities of reclaiming this land through deep tillage; (5) It is very probable that deep tillage may be the answer to dust storms in the West Texas area.

In employing the Towner disk plow, using four bottoms, the tool will cover from two to two-and-one-half acres per hour with a "Caterpillar" Diesel D8 tractor. Many tractor and plow owners are able to average one-and-one-half acres per hour for the entire season. In most cases, the D8 tractor is operated in third gear. In 1949, 29,000 acres were deep tilled in Terry County, Texas. During the 1949-1950 season, Dawson and Lynn Counties witnessed approximately 35,000 acres deep plowed. Such reclaiming in deep tillage methods may truly be the answer to a new era in the dust-laden West Texas plains.

"U.S.F.S." DEVELOPS RUGGED EQUIPMENT

From Smoke Jumpers to Range Reseeding Forest Service Engineers in Forest Green in North Pacific Area Have Gone Heavily to Diesel Ground Machines While Developing Air Borne and High Altitude Midgets

By:- F. Hal Higgins

THE U. S. Forest Service has its traditions of service in subdued forest green uniforms that rank it as high in deeds of daring and ingenuity as any of the more publicized services that have fought their country's battles. And the top in developing mechanized tools for its battlers against fire and pests and the restoration of scourged forest lands is the North Pacific Region men, with headquarters at Portland, Oregon. It's been more than twenty years since the writer first saw the engineers of this region demonstrate to the other regional U. S. Forest Service engineers their new techniques and tools for battling fires when a special school was held in the Santa Barbara National Forest of California for mechanized forest work. Many of the men gathered from the eight or ten regions of the United States have passed out of the service in retirement or to answer the last call. "Ted" Flynn, who was then a braw lad with a practical approach to mechanization of the hand and horse jobs as done in forest fire trail building and fire fighting, has retired after a notable life in the service that reached a climax in his air borne tractor that was taken by the U. S. Army for use in the Pacific war areas.

So, in a recent flight into the Northwest, the writer took a day off to stop off in Portland on his way to Seattle and check up on, the U. S. Forest Service's North Pacific staff and its doings via diesel while asking about some old friends in the service, including the retired Chief Equipment En-

U. S. Forest Service baby tractor, a post-war improved version of their famed war borne tractor that was built by Clark in Michigan to the number of over 10,000 for transport by airplane to inaccessible fighting spots to make airfields, landing strips, etc.

gineer Flynn. Acting Regional Forester Merle S. Lowden delved into his files and called on his high staff men for the answers to the questions on what's doing now, new equipment being developed, diesel-power in the service, etc. Sixteen years after the Wright brothers' first flight at Kitty Hawk, the Forest Service pioneered the use of airplanes in forestry when the idea was still brand new with the postal service. By 1919 the U. S. Army was coaxed into cooperation in testing planes in forest protection work. Young "Hap" Arnold was the young man in charge of this first forest patrol work by plane. Arnold later became chief of the Army Air Force. By 1938, the Forest Service began buying planes instead of hiring services.

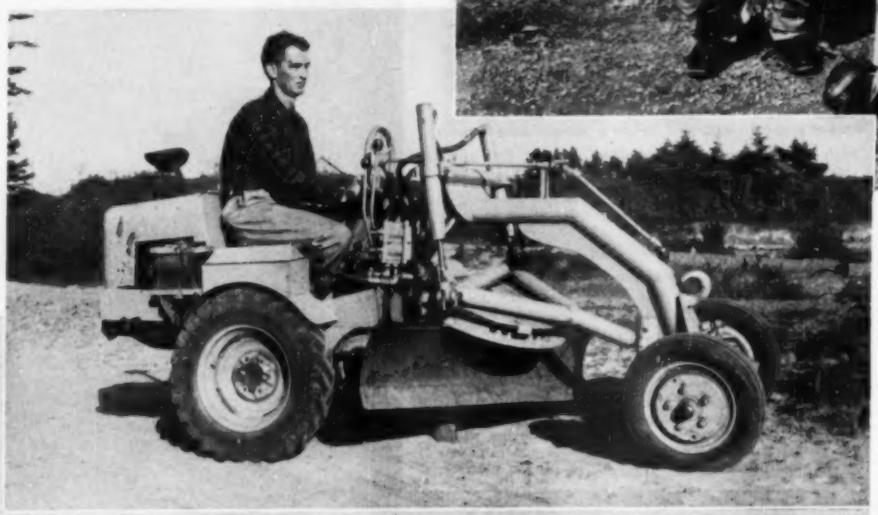
By 1949, it owned sixteen. Year by year, the Service perfected and standardized its aerial tools until aviation developed for delivering a jumper to a fire like this: the pilot and jumper fly across the spot of smoke and drop a burlap test chute with 10-pound bag of sand. The pilot circles and estimates the wind drift. On his second flight he gives the jump signal to his passenger, who lands within 50 to 200 yards of the desired spot. Pilot makes a third circle and drops a burlap parachute with bag of tools, lamp, two days' rations, first aid kit, water canteen, etc. Five to ten minutes covers the entire operation. Where more than one jumper is to be landed, a spotter in the plane takes over job of timing jumps and drops. Aerial photos, range management, management of wildlife re-

This little number is a bit more stable than the first, which was high and narrow for safe operation on rough terrain. It may be a small diesel engine will power this if and when the U. S. Air Force decides it needs a new airborne tractor for fighting in far places.

sources, seeding, etc., are also plane jobs that are growing more and more important.

The reseeding of the range in open areas in the forest under control of the U. S. Forest Service has become standardized and covered by a handbook based on experience in use of certain heavy duty tools and techniques. Here is where the rugged diesel tractors and graders come into the picture. The work of building up the cattle and sheep carrying capacity of our national forests to increase meat and wool production is covered under these sections; ground preparation, or eradication, equipment such as offset disk harrows, disk plows like the heavier farm implements as Wheatland one-way plows and the more rugged Brushland plow developed by the retired Ted Flynn; pipe harrows such as the writer saw in the Ogden, Utah, area four or five years ago; ordinary railroad rails, and miscellaneous implements. But the heavier and ruggeder the tools the more diesel power in crawler tractors required. The International TD 14, TD 18 and TD 24, the Cat D8 or Allis-Chalmers HD 14 and HD 19 are great favorites all through the rocky and rough terrain of the mountain areas. Brush burning equipment, chemicals and spraying equipment have usually been light items that were carried by hand or on Jeeps. But ground seeding equipment calls for the crawler diesels again to get over the rough ground, though some light broadcasters are used. The seeder box on top of the one-way disk plows like Wheatland and Brushland do an effective job behind the big diesel tractors. Multiple hitch soil packers again call on the big diesel crawlers for the rougher lands. The suggested reseeding outfits say the U. S. Forest Engineers, calls for 35 to 80 hp. crawler tractors for six of the ten conditions encountered. For clean sagebrush burns, the wheel tractor can be used.

Portland Regional Office of the U. S. Forest Service developed this famous airborne tractor so successfully used during World War II. This is a typical Forest Service engineering of economy-size tools to battle forest fires at high altitudes and inaccessible spots. All photos on these and two preceding pages by and with the courtesy of the U. S. Forest Service.



Thousands of miles of Forest Service roads require maintenance such as is being done here by Caterpillar "12" patrol grader.

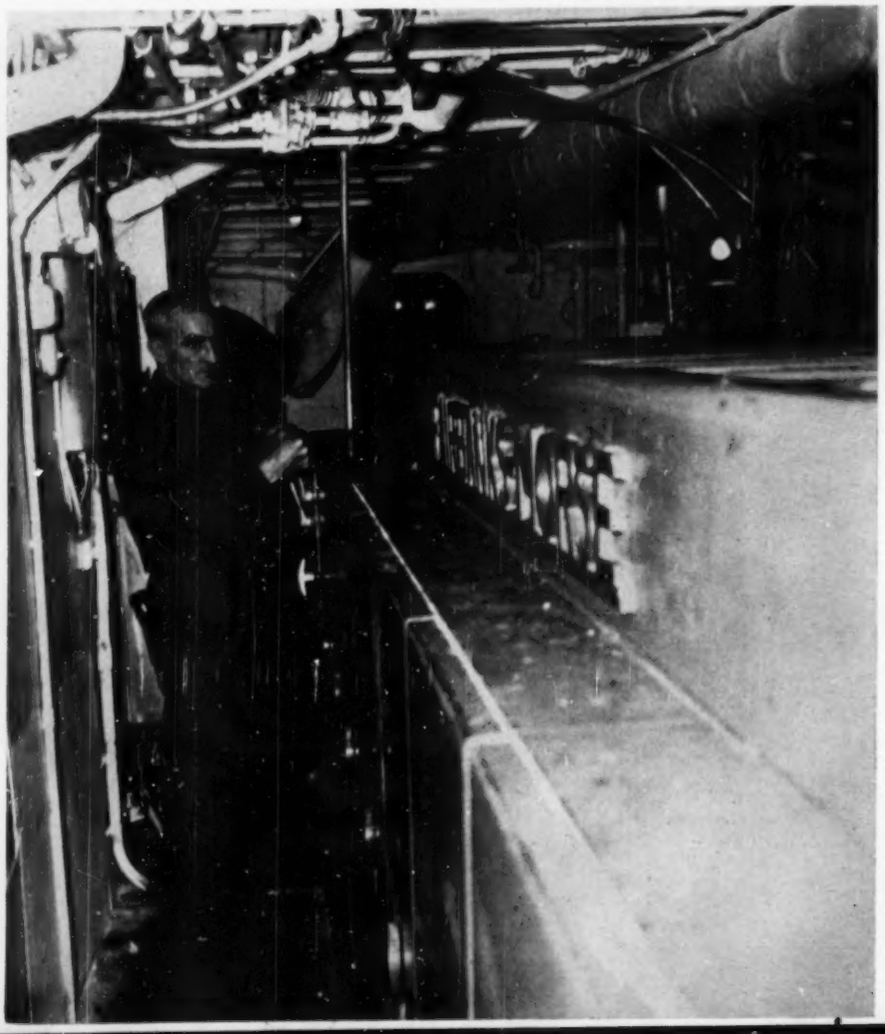
Special brush-piling teeth are used on various tractors to pile logging debris in road and land clearing work. Originally developed by the Forest Service, these teeth have been variously modified and widely used by both government and private operators.

MARILYN ROSE, PACIFIC'S NEWEST TUNA CLIPPER

Sturdy 100-Footer Has 177-Ton Capacity; 480-Horsepower Fairbanks-Morse Diesel Powers Fast, Well-Equipped Fishing Vessel

By HENRY J. BARBOUR

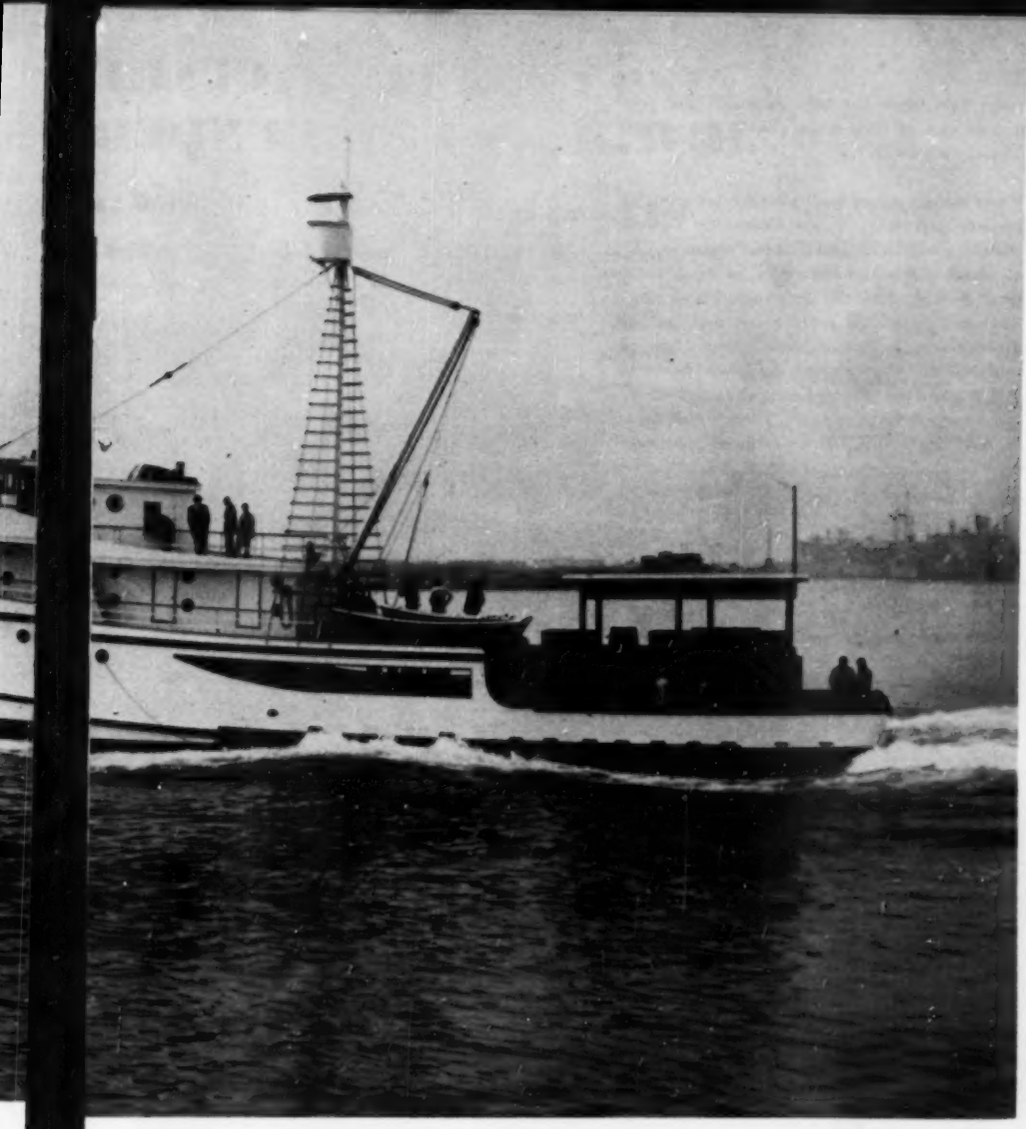
THE *Marilyn Rose,* newest tuna clipper in the Pacific fleet, is classified as a "baby clipper," but she is a sturdy, powerful baby, designed for efficient operation and equipped for profit. Built by the Long Beach Marine Repair Company with the close supervision of the partners, Frank L. Munsuy, David F. Maxwell and George A. Robinson, the vessel was completed this spring and, as this is writen, is fishing off the coast of Southern California. The owners believe that, though tuna prices are past their peak, there is abundant opportunity for profit for skilled fishermen with good modern equipment. The *Marilyn Rose* was designed for good fishing, good capacity and economical operation. The strongly-built vessel has an overall length of 100 feet, a beam of 25 feet and a depth of 11 feet 8 inches. Total fish storage capacity is 177 tons.



Like the biggest of the clippers, the trim, attractive *Marilyn Rose* is of the triple deck type, with a main deck, raised deck and bridge deck. The main deck includes the combination galley and mess room, a refrigerator and the boatswain's stores.

Also on the main deck is the upper engine room, which contains the refrigeration compressors, engineer's tools and work bench. The meat box is placed aft on the starboard side of the upper engine room with entrance from the galley. On the raised deck are the staterooms for the captain, chief engineer and a crew of twelve, also a chapel, radio room, net room, gear lockers and the exhaust casing. The bridge deck holds the pilot house and chart room. In all there are thirteen fish holds, including three bait boxes on deck, two steel wing tanks which serve as combination fuel storage tanks and bait wells, and eight wooden wells be-

The Pacific's newest tuna clipper is powered with a 480 hp. Fairbanks-Morse marine diesel. This compact engine provides abundant power in limited engine room space.



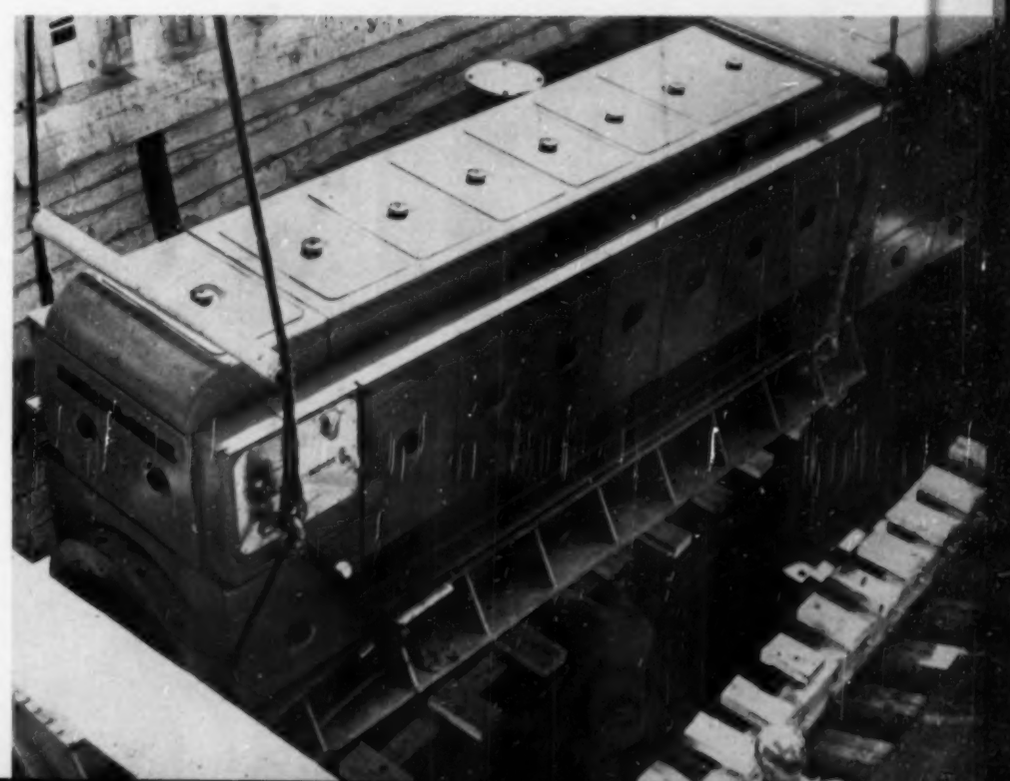
All the pumping equipment, together with the electric motors, was supplied by Fairbanks, Morse & Co., including two 8-in. bait water pumps, ten 3-in. brine circulating pumps, one 3-in. brine transfer and bilge pump, one 3-in. ice machine circulating pump, one 3-in. bilge pump, one 2-in. fire and washdown pump, and one 1¼-in. fuel oil transfer pump. The fresh water and salt water pressure systems are also Fairbanks-Morse. For cargo refrigeration, there are three 5-in. by 5-in. Worthington ammonia compressors driven by 25 horsepower high-torque electric motors. Galley refrigeration is supplied by a 3-in. by 3-in. compressor. The submerged type condensing system is equipped with two receivers. The system is supplied with water from the bait line with cross connection to the condenser service pump.

From engine room to pilot house the *Marilyn Rose* is fitted with the modern equipment necessary to smooth, efficient operation. In the pilot house there are such operational and navigational aids as ship-to-ship and ship-to-shore radio, fathometer and full engine room controls. On deck there are a 450-lb. and a 750-lb. stockless anchor, an anchor winch and a cargo and boom hoist. There are three auxiliary boats, an 18-foot tuna tender with a 110-hp. Chrysler engine, a 19-foot skiff and a 12-foot work boat. As noted above, the owners' formula for success included skilled fishermen and good modern equipment. Both have been provided in the case of the *Marilyn Rose*. The skipper is Tony Brown and the chief engineer is Herbert Allen. The *Marilyn Rose* is out to prove that a good baby clipper can compete with the giants of the Pacific tuna fleet. She has the power for the job.

The *Marilyn Rose*, new 100-ft. tuna clipper, is shown here on her trial run before joining the fishing fleet in waters off Southern California.

low deck, four to port and four to starboard. Fuel capacity totals 19,142 gallons, including the combination fuel-fish tanks and three main storage tanks, one at the bow and two at the stern. There is capacity for 2,019 gallons of culinary water in two steel tanks forward of the wing fuel tanks.

The power plant chosen for this vessel was in keeping with the other elements of design—strong, compact, efficient, and trim in appearance. The propulsion engine is a 480-hp. Model 8 1A8 1/2 Fairbanks-Morse marine diesel with four cylinders of 8½-in. bore and 11½-in. stroke developing the rated horsepower at 525 rpm. Equipped with a 2 to 1 reduction gear, this heavy-duty two-cycle direct-reversing engine drives a 77-in. diameter, 60-in. pitch, 3-blade bronze Doran propeller through the intermediate and monel tail shaft. The diesel is smooth-running and virtually free from vibration. Low fuel consumption is not only an economy factor but also permits greater range for the vessel with existing fuel storage.



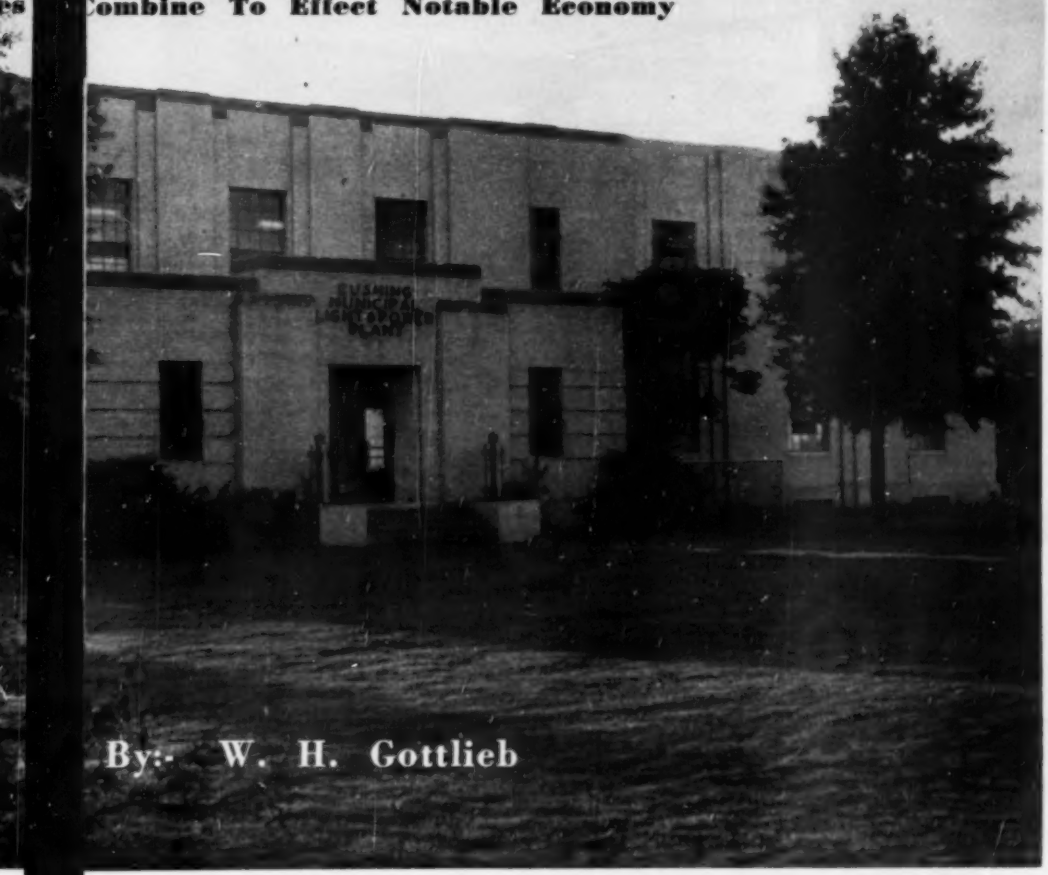
This shows the 480-hp. Fairbanks-Morse diesel being lowered into the vessel.

A NEW Fulton dual-fuel engine is producing power in the Cushing, Oklahoma, municipal plant for a total fuel cost well under 2 mills per kilowatt hour. The result is additional profit for a plant that already has earned more than $1,000,000.00. The achievements of dual-fuel equipment in this power station are particularly noteworthy because the plant is ideally located for the economical operation of oil-burning diesels. The oil refinery which supplies fuel to Cushing is just across the street from the plant and fuel is pumped directly from refinery storage tanks to plant storage tanks without any transportation costs. As a result, this plant currently pays less than 6 cents a gallon for a 36 API gas oil, and the margin for saving even with cheap natural gas is much smaller than in the average plant. Yet, with the development of modern dual-fuel prime movers, it became evident to Cushing engineers that important savings could be effected by conversion to natural gas. First step was the conversion in November, 1948, of the four McIntosh & Seymour diesels then in service, three 750-hp., and one 1,170-hp. engines. Although the converted units required 21 per cent pilot oil, the total cost of fuel per kw. hr. was cut from an average of 5.23 mills in the fiscal year ending June 30, 1948, to an average of 3.96 mills the following year. This figure has been improved and peak performance of these units gives a cost of only 2.3 mills per kw.hr.

When the expanding load made further plant expansion imperative, it was natural for Cushing officials to seek an efficient dual-fuel engine capable of affording a maximum return for every dollar spent on fuel. Also, the city's engineers wanted a slow-speed, heavy-duty prime mover that could be depended on for unfailing service over a long period of years. Their choice was a 4-cycle, 6-cylinder Fulton engine of 17½-in. bore and 24½-in. stroke, rated at 1,420-hp. at a slow 277 rpm. This supercharged engine is designed to run on natural gas with just 7 per cent pilot oil. It can, of course, also operate as a full diesel. The engine was installed in June, 1949, and a thorough field test was conducted August 22nd by the engineering firm of V. V. Long & Co. Table I gives a detailed report on that test, including load, consumption of fuel oil and natural gas, cooling water pressures and temperatures, exhaust temperatures, lube oil pressures and temperatures, piston cooling oil temperatures, and other significant performance data. The percentage of total Btu. requirements supplied by the pilot oil varied with the load from an exceptionally low 5.1 per cent to a moderate

...G CUTS FUEL COSTS TWO MILLS PER K.W.H.

...ton Dual-Fuel Effeiency Plus Low Fuel ...Combine To Effect Notable Economy



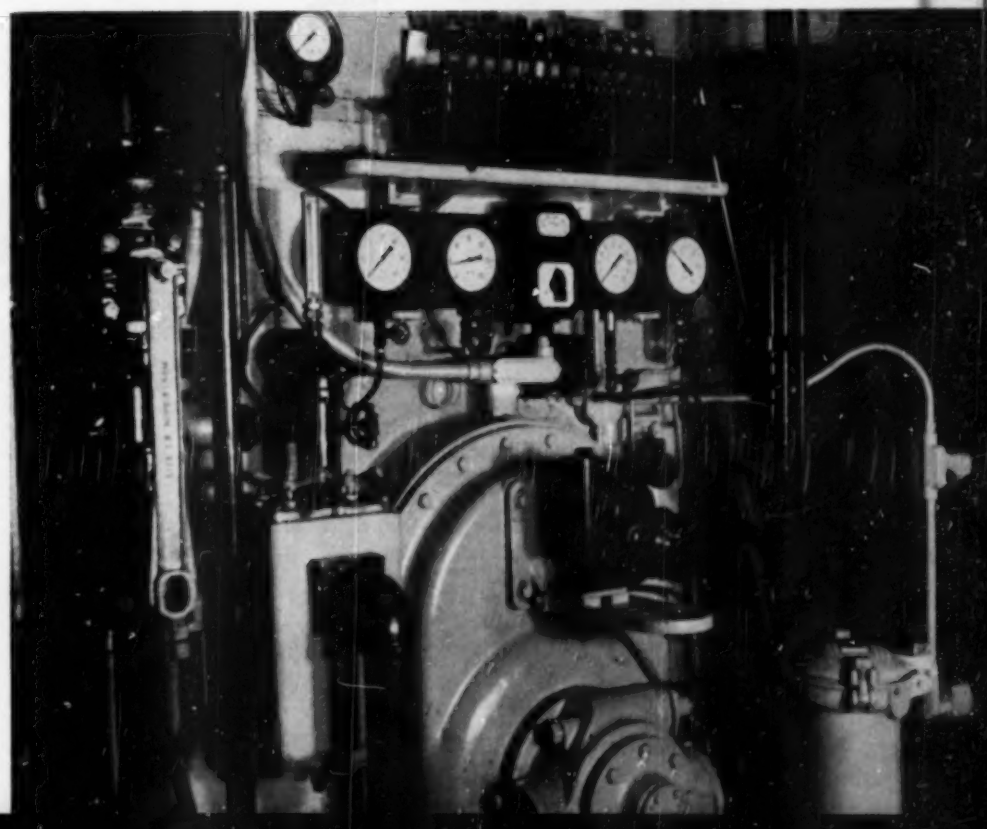
By:- W. H. Gottlieb

8.5 per cent. Thermal efficiency was good, with Btu. consumption always lower than the guarantees. Here is the comparison for dual-fuel operations:

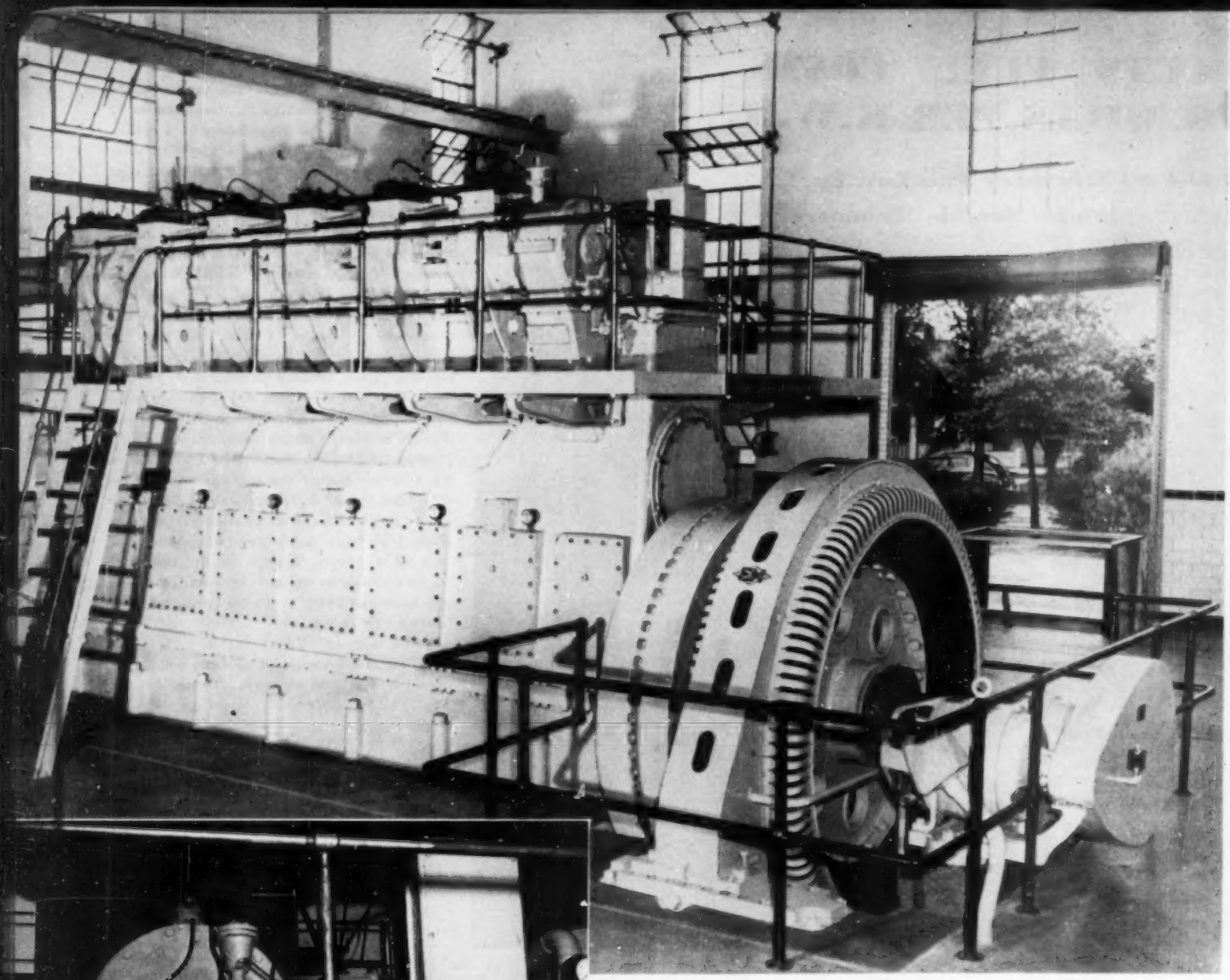
	Btu. per Bhp./Hr.	
Load	*Guarantee*	*Test Performance*
One-half	7,900	7,334
Three-fourths	7,200	6,759
Full	6,800	6,535

In actual operation, this efficiency level has meant a total fuel cost close to 1.75 mills per kilowatt-hour. As a result, the new engine is kept in continuous operation except for necessary servicing. When this writer visited the plant, the valley load was about 600 kw., which would have provided a better load factor for the 1,170-hp. unit, but the superior economy of the new unit made it desirable to run the 1,420-hp. engine 24 hours a day with loads varying from 60 to 80 per cent. It is expected that the new engine will produce more than half the plant's total annual output of 10,000,000 kwh. In all, the switch from straight diesel to dual-fuel has meant a fuel saving of about $20,000.00 a year. Design of the Fulton's fuel system provides for accurate control of both gas and intake air to insure proper balance and good combustion at all loads. The gas reaches the plant at 20 psi., is reduced by a regulator to 12 psi., and is carried to the cylinders by a header. At each cylinder there is a gas admission valve activated by a rocker arm from a cam shaft. Governor linkage turns a shaft which controls the effective opening of the valves and thereby the amount of gas admitted to the cylinders. Intake air passed first through a governor-controlled admission valve, then through a filter and silencer to the exhaust-driven turbo-charger. To achieve swift, sensitive control, the air valve is actuated by a compressed air system. A ¼-in. line from the starting air bottle at 200 psi. carries air through a regulator where pressure is reduced to 65 psi., then to a governor-controlled actuating valve which operates the air intake valve. Reaction to changes in load is almost instantaneous. If gas pressure fails, lube pressure moves a piston altering governor linkage and automatically switches the engine to full dependence on diesel oil. For normal dual-fuel operation, pilot oil is regulated at about 7 per cent of full-load fuel requirements. Fuel oil is pumped through waste-packed filters to storage, then to elevated day tanks in the engine room and finally by gravity through bag-type filters to the engines.

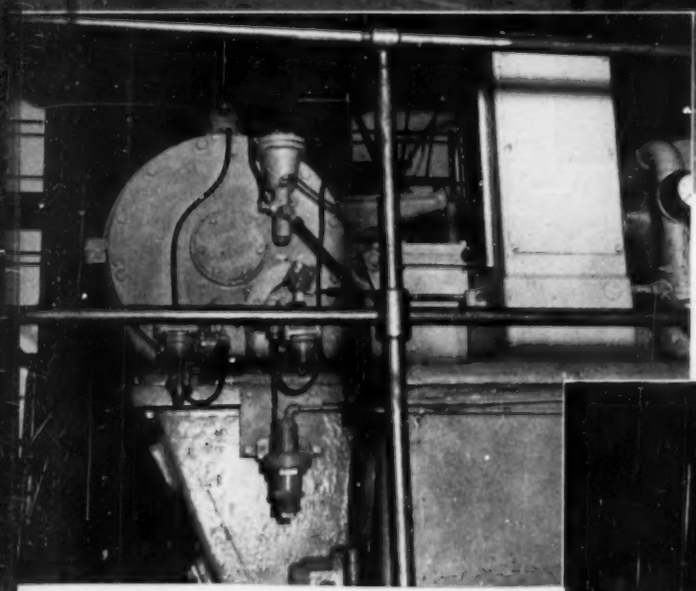
Handling of lubricating oil has been notably successful in this plant and seems destined for even better records. Horsepower-hours per gallon of lubricating oil consumed in the year ending June 30, 1949, was 6,057, but the plant reports that the new engine is running 8,500 hp. hr. per gal. of lube consumed. Needless to say, all lube is reclaimed and none is discarded. Oil is pumped continuously from engine sumps through a fuller's earth and back to the sumps. The filter serves all the engines and is switched every 8 hours. In addition, there is an oil reclaimer which combines

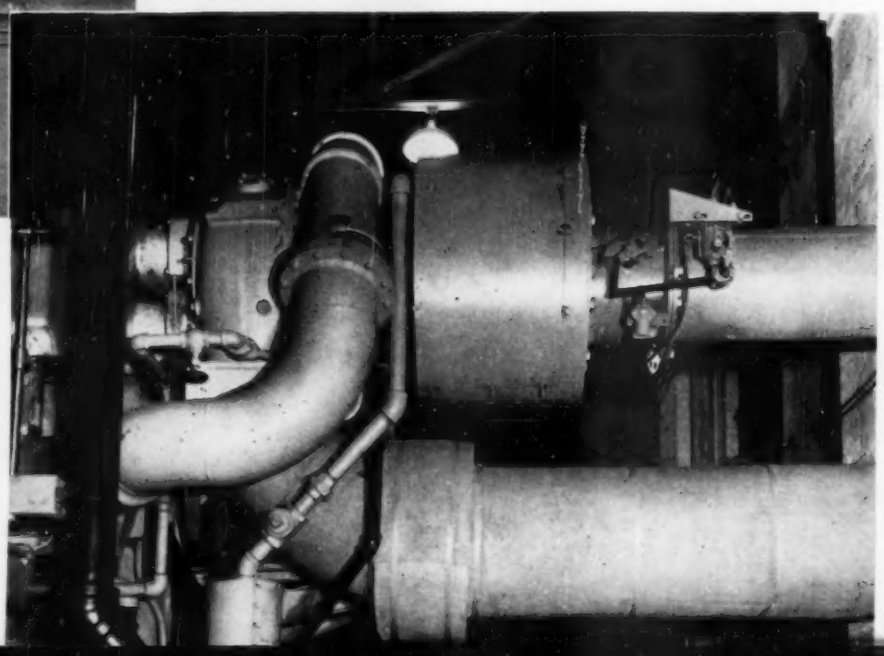


Included in this closeup of the new Fulton dual-fuel engine are the Manzel cylinder lubricators, the Brown exhaust pyrometer, the Cuno lube filter and the Nugent fuel filter.



For dual-fuel operation, intake air is controlled by the governor by means of a compressed air operated valve. This view shows the control mechanism, the Air Maze air filter and silencer, and the Elliott-Buchi turbocharger.





Compressed air from the starting air supply is reduced to 65 psi. and provides almost instantaneous control of intake air valve. If gas pressure fails, lube pressure alters governor linkage and shifts the engine automatically to full diesel. Failure of fuel oil pressure shuts off the gas supply.

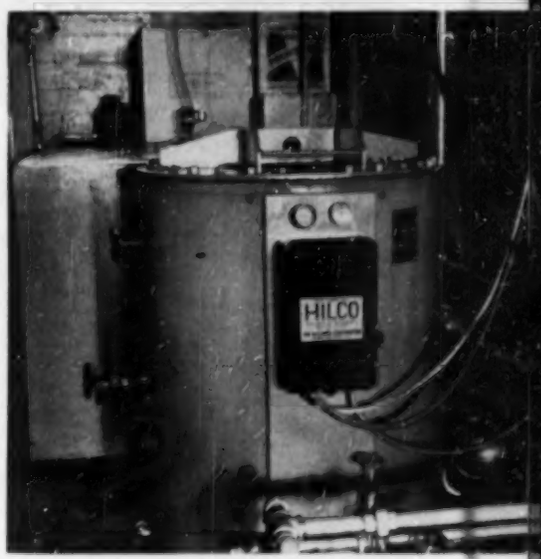
fuller's earth filtration with an electronic vaporizer to eliminate water and fuel dilution. This unit, too, serves all the engines and usually is switched at 24-hour intervals. Oil samples are sent in for laboratory analysis every six months, and the reports always show the oil as good as new with no acid, sedimentation or residue. Consequently no oil change has been made in 12 years. Further evidence of successful lubrication is the absence of stuck rings and the small cylinder wear. All bearings of the new engine are lubricated by a pressure system, which also supplies oil to cool the pistons. Included in the system are an engine-driven pump and a shell-and-tube oil cooler. Cylinders are supplied with oil by force-feed lubricators. The only new oil added goes into these lubricators; none ever is added directly to the crankcase supply. Duplicate equipment insures adequate cooling for the engines. All the prime movers are tied into dual cooling water headers, either of which can handle the entire plant. Water is circulated through the engine jackets and through the coils of two induced-draft cooling towers by five motor-driven centrifugal pumps while an equal number of pumps handle raw water for the towers. Four new 800 gpm. centrifugals were installed with the new engine. City water is used for makeup and receives further treatment before introduction into the jacket supply.

The plant has been enormously profitable despite rate schedules which range from a maximum of 6 cents to a minimum of 1 cent per kilowatt-hour. This compares with a maximum rate of 11 cents per kw. hr. which prevailed when first action was taken to develop a municipal plant. Official reports for the fiscal year ending June 30, 1949, show an income of $285,872.92 and expenses (including administration, generation, distribution and fixed charges) of $157,894.31, leaving a net gain of $127,978.61. The balance sheet shows a total surplus of $1,282,311.74, accumulated since the plant was started in 1936. Impressive as these figures are, they gain by translation into community benefits. This city of 10,000 population has unusual cultural and recreational facilities. There is a $150,000.00 swimming pool and another is planned. There is one concrete stadium for baseball and another for football. There are a large modern library, air conditioned municipal buildings, a new fire house. To top it all, the city is tax-free. With its new engine producing power for a total fuel cost of just 1.75 mills, this fast-growing prosperous community can look forward to greater profits and further benefits.

Principal Equipment Serving New Engine, Cushing, Okla., Municipal Power Plant

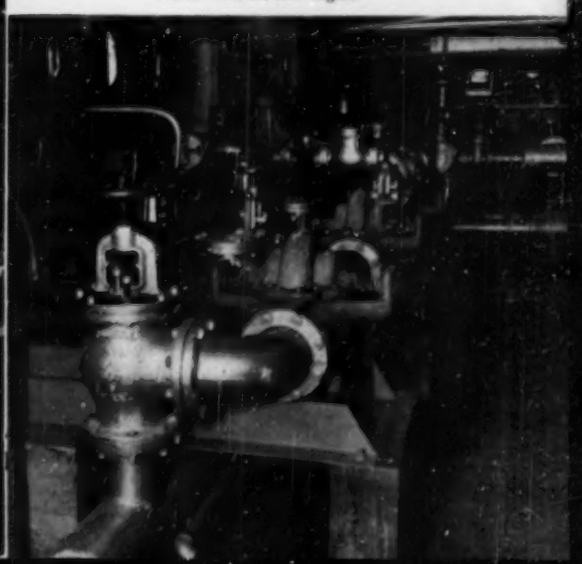
Engine: Four-cycle, six-cylinder, 17½x24½ in., 277 rpm., supercharged dual-fuel engine. Fulton Iron Works.
Generator: 1,250 kva., 1,000 kw., 2,400 volt, 3-phase, 60-cycle synchronous generator.
Turbocharger: Elliott-Buchi. The Elliott Co.
Governor: Woodward Governor Co.
Gas Regulator: Emco. Pittsburgh Equitable Meter Co.
Fuel Meters: Pittsburgh Equitable Meter Co.
Engine Air Controls: Westinghouse Air Brake Co.
Lubrication Oil: Rubilene Heavy. Sinclair Refining Co.
Lube Filters: Hilco Hyflow. The Hilliard Corp. Cuno Engineering Co.
Lube Reclaimer: The Hilliard Corp.
Turbo Lube Filter: Wm. W. Nugent Co.
Cylinder Lubricators: Manzel Brothers.
Lube Cooler: Graham Mfg. Co.
Auxiliary Lube Pump: Tuthill Pump Co.
Fuel Oil Filter: Wm. Nugent & Co.
Cooling Water Pumps: Fairbanks, Morse & Co.
Cooling Towers: Marley Co. United.
Starting Air Compressor: Worthington Pump & Machinery Corp.
Intake Air Filter and Silencer: Air Maze Corp.
Piston Rings: American Hammered. The Koppers Co.
Exhaust Pyrometer: Brown Instrument Co.
Thermometers: Electric Auto-Lite Co.

In addition to continuous filtration, lubricating oil is put through this Hilco oil reclaimer to remove fuel and moisture dilution as well as solid impurities.

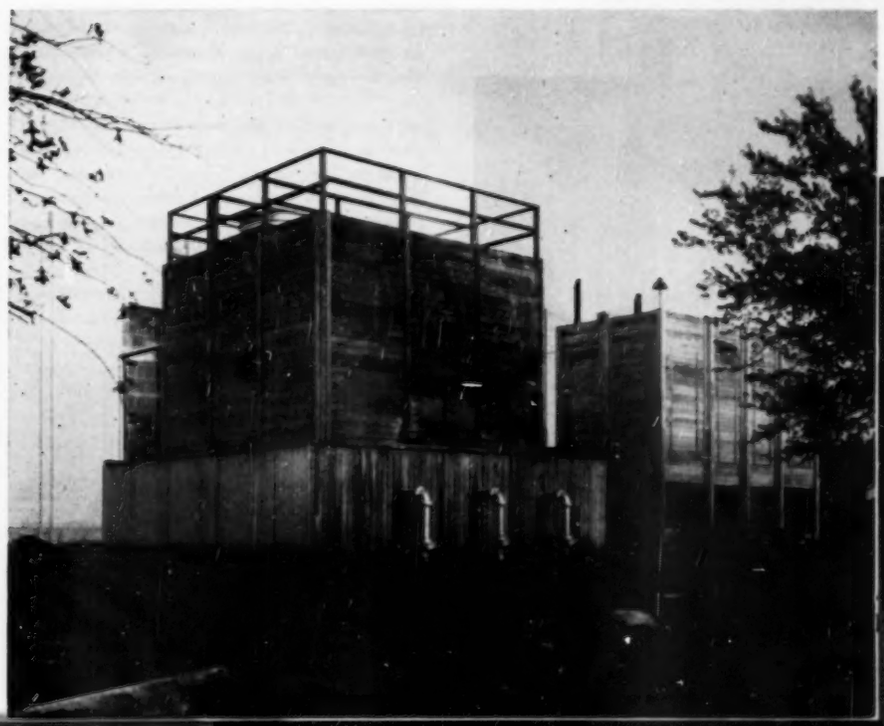


Lube is pumped continuously from engine sumps through this Hilco Hyflow filter with its fuller's earth filtration elements. The unit is alternated to serve all engines.

Cooling water is circulated through the engines and cooling tower coils by Fairbanks-Morse motor-driven centrifugal pumps. The four pumps shown were installed with the new engine.



Cooling water is circulated through coils in these induced-draft cooling towers, one a United, the other a Marley tower.

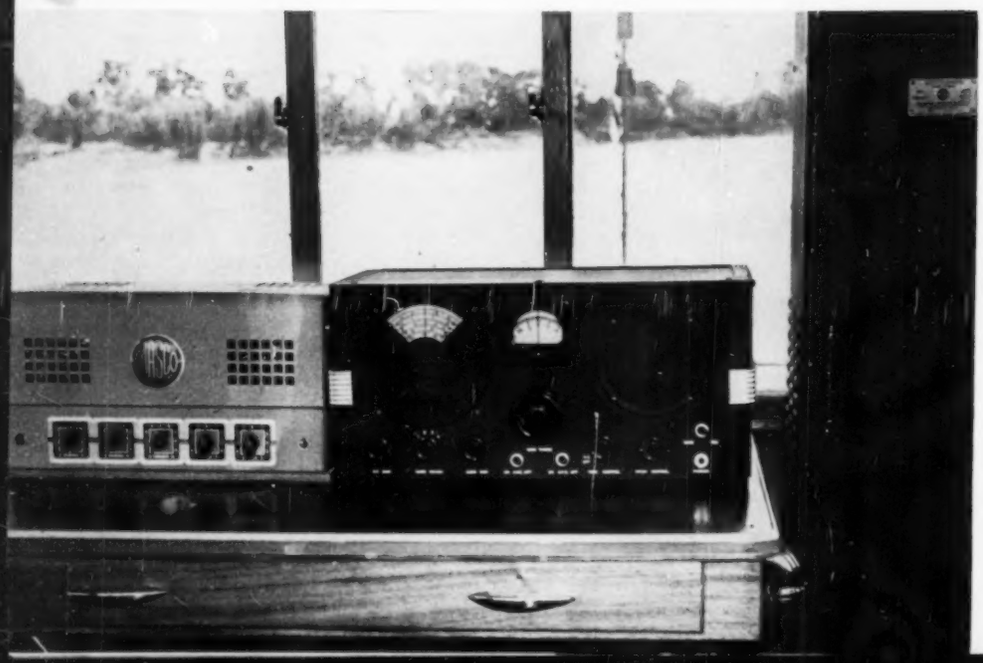


ZEPHYRS AT WORK

Careful Handling of Fuel and Lube Helps Towboat Achieve Service Mark of 23,000 Engine Hours in 3 Years.

By WM. H. GOTTLIEB

Left to right: H. T. Pott, President St. Louis Shipbuilding & Steel Co.; Mrs. Kenneth C. Baker, sponsor; Mrs. H. T. Pott, Harper C. Patton, Mrs. Harper C. Patton, Kenneth C. Baker. (Below) Ship and Shore Radio.



THERE are many factors to consider in appraising the performance record of a towboat: tonnage of tows handled, speed, operating economy. But one of the major considerations is availability. Frequent overhauls are costly not merely for the work involved but because they keep the boat out of service and limit the volume of profitable operations. In every department, the Zephyr fleet of the Streett Towing Company, St. Louis, has rolled up a notable record, and the emphasis has been on availability. The streamlined *Havana Zephyr*, described in detail in the November, 1946, issue of DIESEL PROGRESS, was in almost continuous service for three full years without an overhaul. In that time, her diesels were turning over 23,000 hours, more than 87 per cent of the time. During that period the boat was engaged in arduous river towing, taking tows of 6,000 to 8,000 tons of petroleum products from Baton Rouge, La., up to New Albany, Ind., and Louisville, Ky., on the Ohio, and as far north as LaCrosse, Wis., on the Mississippi. Speed upstream fully loaded averaged a steady 5 mph. with the return trip at 14 mph. Though working at full load and overload the two 990-hp. Superior diesels consumed just 2,400 gals. of fuel in 24 hours. After 23,000 hours, an overhaul was scheduled as a precautionary measure. Pistons were pulled and the engines were found to be in excellent condition. There were no stuck piston rings. Maximum cylinder liner wear was just .014-in. Bearing wear was negligible.

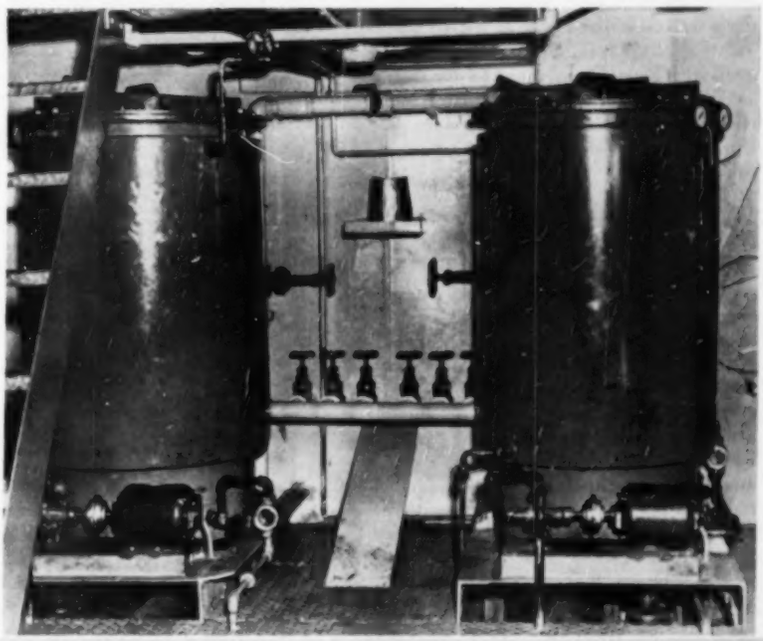
According to Chief Engineer Herman W. Merritt (now on the new *St. Louis Zephyr*), a share in the credit for the *Havana Zephyr's* achievements belongs to the well-engineered system for handling fuel and lubricating oil. It was felt that the best way to keep the engines well lubricated was to remove contamination from the oil by continuous filtration. Consequently, each diesel is served by a six-element Hilco Hyflow filter. A motor-driven pump draws oil from the sump tank, puts it through the filter and back to the sump. A Streett detergent-type lube is used and so the filter elements are packed with a fine Hilfex cellulose which does not remove the additives but effectively removes sludge, tars, water droplets and dirt particles as small as 3 to 4 microns. The cartridges in this case are of the repackable type and are repacked about every 500 hours. Diesel fuel sys-

tems are finely machined to close tolerances and filtration of the fuel was deemed desirable to insure against scoring or clogging the injection pumps and nozzles. To provide this insurance, another multi-element Hilco Hyflow filter is installed between the 164-ton fuel storage and the engines. Experience with the *Havana Zephyr* undoubtedly influenced the design and choice of equipment for the new *St. Louis Zephyr*, which went into regular service last fall. Again the main propulsion engines are supercharged Superiors, but in this case are rated at 1,440-hp. each. Again Hilco Hyflow filters are used to condition the oil. In this case, however, it was decided to go one step further and have full-flow rather than by-pass filtration. All the lube goes directly from the scavenging pump on the engine through the filter and then to the sump tank, where it is picked up again by the built-in pump that supplies the engine. To accommodate the higher volume of flow, a special extended area disc-type filter element capable of removing solids as small as 2 to 3 microns was built for this installation. This Hilco filter element has a very high flow rate at a low pressure drop, resulting in 100 per cent full flow filtration.

The powerful *St. Louis Zephyr* takes her 8,000-ton tows up the river at 6 mph. and averages about 14 mph. downstream. Fuel consumption for the 2,880-hp. power plant averages between 2,700 and 2,800 gals. each 24 hours. Storage capacity is sufficient to permit three full weeks of operation without refueling. Another factor which is expected to improve lubrication for the St. Louis diesels is the engines' vapor-phase cooling system. Cooling water is not allowed to drop below 212°F., and this elevated temperature presents condensation of water on the cylinder walls, which impairs lubrication. Elimination of this condensation also retards formation of sludge. This is the first river boat to employ vapor-phase cooling. Both the Zephyrs were designed and built for Streett by the St. Louis Shipbuilding & Steel Co. and incorporate many features which improve operating efficiency. For example, the *St. Louis Zephyr* has Contra-Guide steering rudders which are said to increase towing efficiency 8 to 10 per cent. Propulsion engines and accessory equipment were chosen to provide a continuous, trouble-free, economical source of power. The three-year operating record of the *Havana Zephyr* attests to the success of the design and equipment.

Upper engine room view showing one of Superior diesel engines *M/V Havana Zephyr*.

To keep the engines going almost all the time, lubricating oil is cleaned continuously in this pair of Hilco Hyflow filters with cellulose-packed filtration elements that remove sludge, tars, water droplets and dirt particles.



The Havana Zephyr

NEW DIESEL SHOP FOR FRISCO LINES

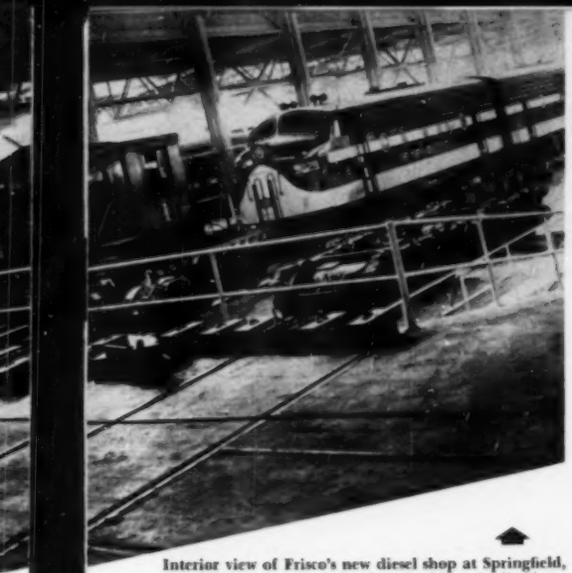
By DOUGLAS SHEARING

Aerial view of Frisco's recently completed diesel shop with surrounding facilities at Springfield, Mo. In the lower left hand corner is the new enginemen's wash and locker room.

THE first of May was moving day for many of the Frisco personnel as they took up operations in the company's new diesel shop and office, units in the $5,000,000 yard modernization and improvement program at Springfield, Mo., operating hub of the railway. The entire project was the largest single construction job ever undertaken by the Frisco and includes the new yard, with a 2,600 car capacity; a new office building and restaurant for employees; new icing facilities; car repair tracks and facilities; an oil reclaim building; wash and locker room for enginemen; inter-communication system; floodlighting for the yard; and an up-to-date shop to handle the large and still growing fleet of Frisco road and switching diesels. Only minor units of these facilities remain to be placed in service.

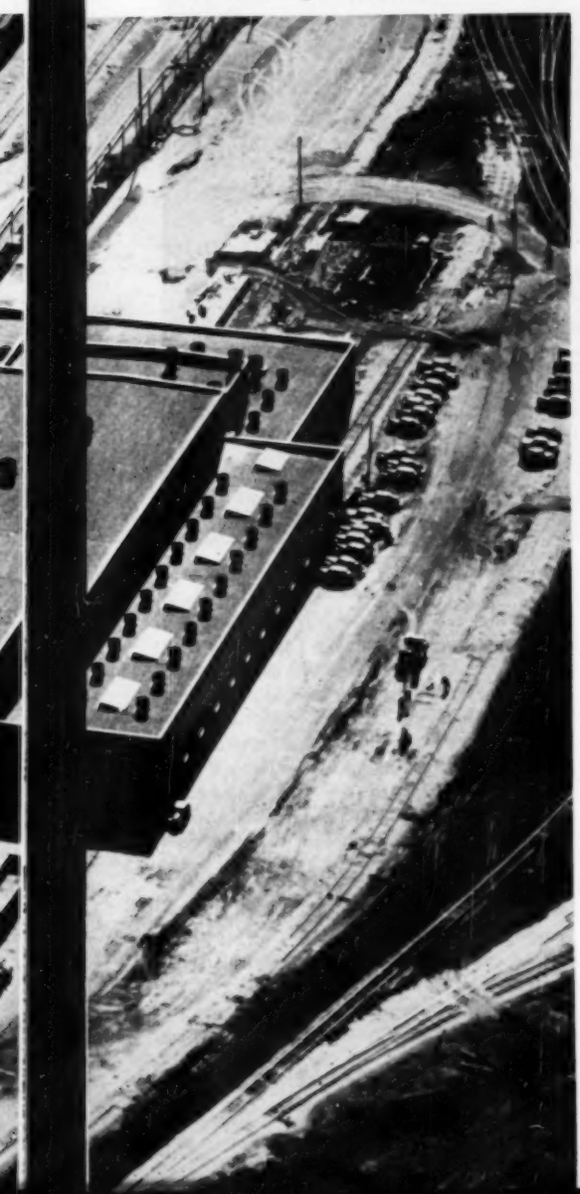
The new yards adjoin the site of the old Frisco West Locomotive and Coach Shops and include 30.6 miles of trackage in 32 tracks—11 westbound and 11 eastbound classification tracks, three westbound and three eastbound receiving tracks, one westbound and one eastbound caboose track, one 8,900-foot track for movement of engines, and one 2,360-foot icing track serving a new 320-foot icing dock located between the eastbound classification and receiving yards. Capacity for the classification tracks is 1,574 cars; for the receiving tracks, 936 cars, and for the caboose tracks, 70 cars. Incoming trains are routed over receiving tracks which are the "outside" tracks, are serviced and switched to the classification tracks in the center, where diesel road engines pick them up. The grade of the classification yard is "saucer-shaped" to permit gravity switching from either end. On the north side of the westerly half of the classification yards is a light-repair yard consisting of four repair tracks with total capacity of 125 cars. On each side of these tracks is a reinforced concrete curb and concrete runway, the distance from curb to curb across the track being seven feet. This arrangement permits cars to be jacked up at any point along the tracks. Mechanized equipment, operating on the paved runways, handles material for the car repair work. The repair yard service and supply buildings which will be completely finished and put in service shortly are located along the north side of the repair yard and will house a journal lathe, airbrake and tool rooms, office, wash and locker and toilet facilities, blacksmith shop, oil and waste, paint, lumber, and truck garage.

The two-way tele-talk communication system, consisting of 70 speakers evenly distributed throughout the yard, is centered in a tower adjacent to the mid-point of the yard. This tower is 14 feet by 14 feet and is 60 feet high. The tower house, which is air-conditioned and heated with unit electric heaters, occupies the top 16 feet of the tower and provides office space for the assistant general yardmaster, an observation room, and toilet and locker facilities. Seven floodlight towers, 100 feet high, completely illuminate the entire yard. In the assistant general yardmaster's office are control units for the yard radio system and for the two yard track indicators. The grading for the new yards amounted to 1,030,000 cubic yards, which included the excavation of 49,350 cubic yards of solid rock. Along with the grading, 518 cubic yards of reinforced concrete were built in construction of drainage openings across the yard. One of the major features of the Springfield modernization program is the diesel shop, which incorporates the latest features for diesel repair and maintenance and is housed in a 48,000 square foot building. The main building houses five tracks, one of which is a through track for general service. Of the remaining four stub-end tracks, one is a general service track, one a truck release track, and two servicing tracks for heavy overhaul work. With the exception of the through track, all of the tracks are served by a drop pit 24 feet wide, 18 feet deep, and 98 feet long, in which is installed a 100-ton drop table for removing trucks. Each of these tracks is equipped with body supports for holding up the diesel when trucks are removed. A 30-ton overhead crane with a 5-ton auxiliary crane operates the entire length of the shop in a 75-foot crane bay and serve the two heavy repair tracks and truck release track. The through track and two tracks south of it are built over 214 feet long and 4 feet deep inspection pits and equipped with adjacent elevated platforms along the pits so that upper and lower engine work can be carried on simultaneously. Lubricating oil, treated water, steam and air are available at both the platform and lower levels. The diesel building is constructed of four levels. At the end of the stub-tracks and on a level with the elevated platforms, the utility



Interior view of Frisco's new diesel shop at Springfield, Mo., showing three of the first double unit diesels to be serviced in the recently completed structure. The spaciousness of the building, which adds to the convenient performance of all types of work, can be observed by comparison with the size of the diesel locomotive.

In the background is the foundation of the "lube" oil reclaim building which is now nearing completion, and which houses facilities for blending and refortifying the reclaimed oil.



building has an office, storeroom, parts cleaning and parts reconditioning shop, electrician's shop, and airbrake room. On the basement level is the heavy storeroom, water treating facilities and pumps, and the "lube" oil room in which is stored approximately 69,000 gallons of "lube" oil in ten tanks. About half way between the shop level and the oil room floor is a wash and locker room, store department facilities, and a part of the shop facilities. A 10-ton freight elevator operates to and from this level to handle heavy parts for use on the upper levels. The different elevatons in the building are connected with numerous ramps and stairways. On the south side of the building are two additions housing a large wheel lathe and a large lye cleaning vat.

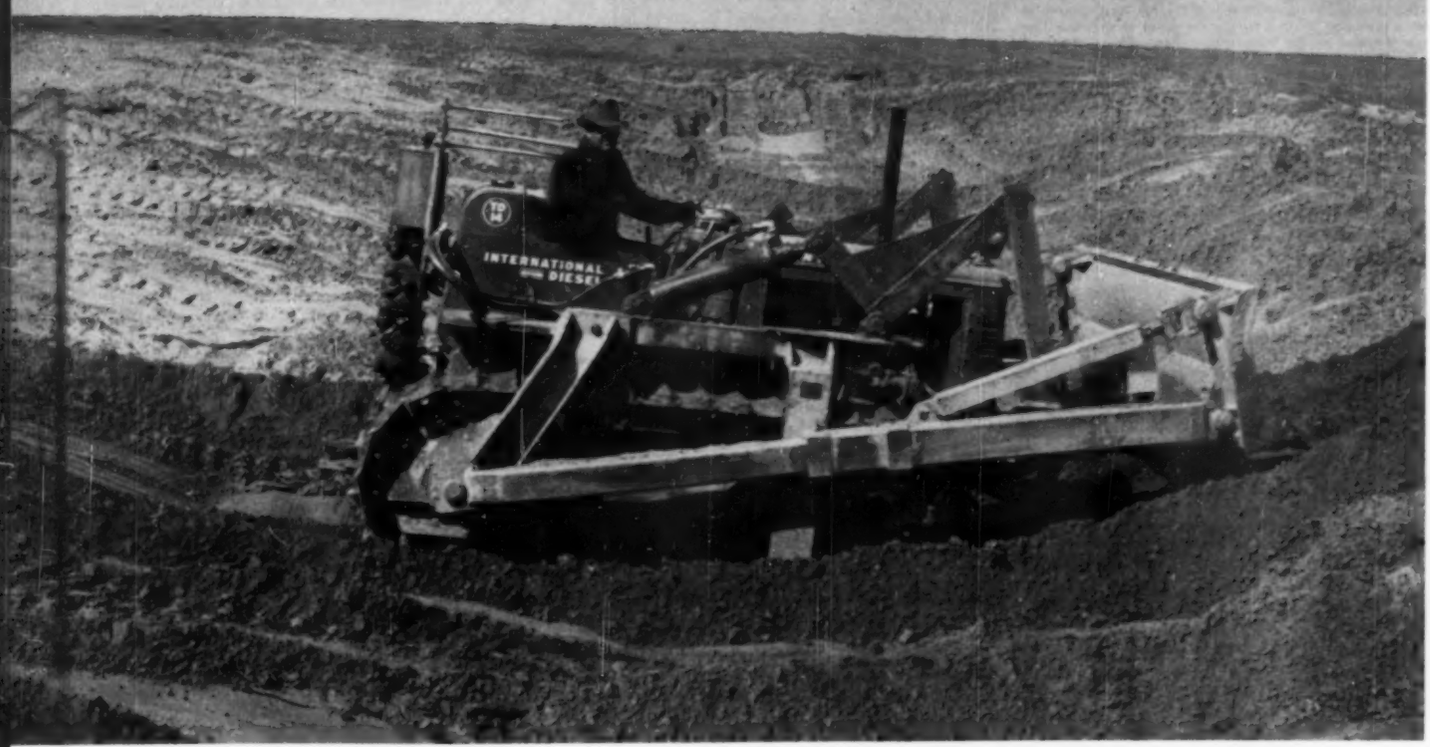
The diesel shop was constructed of heavy steel frame, brick walls with steel decking and built-up asphalt roof. The windows are corrugated with actinic glass panels, the actinic panels blocking out heat rays and preventing sun shadows inside the building. The diesel shop proper is 353 feet long by 127 feet wide. The main part of the building is heated with blast and unit heaters, and the office with convector radiators. Steam and air for the building is supplied from the power plant of the old West Locomotive Shop. The building is equipped with 32 powered ventilators. A two-story, 27-foot by 40-foot "lube" oil reclaim building is being constructed 100 feet west of the diesel shop. In the basement of this building will be three settling and used oil storage tanks and tanks necessary for blending and refortifying the reclaimed oil. On the second floor it will have a testing laboratory and will house two oil retorts with filters and six tanks for holding reclaimed oil. Pipelines will extend to the "lube" oil tanks in the basement of the diesel shop. Approximately 11.4 miles of pipeline have been installed to provide water, steam and air for the new facilities and to provide a first-class fire protection system. It is planned to install a special fire protection system of liquid foam in the "lube" oil room in the basement of the diesel shop and in the oil reclaim plant. Two 55,000-barrel diesel fuel oil storage tanks were constructed northwest of the diesel shop, with unloading facilities consisting of two spur tracks on which ten cars can be spotted for gravity unloading into a 10,900 gallon underground sump tank. From this tank the oil is pumped into the big storage tanks which are set on the same level and cross connected. Fuel supplied to the diesel locomotives is from two 20,000-gallon tanks located along the diesel shop servicing tracks. Oil for these tanks is pumped directly from the large storage tanks. Other units in the vicinity of the diesel shop include sanding facilities consisting of three elevated tanks with a total capacity of 20 tons, which will sand diesels spotted on three tracks, and a brick building 34 feet by 80 feet housing an engineman's wash and locker room. Prior to designing the new yards and diesel facilities, Frisco engineers visited major yards and diesel plants throughout the country endeavoring to get a complete picture of all the latest developments in freight-handling operations so that Frisco could give its shippers the best in safe, speedy service.

Another of the major features of the Springfield modernization program is the recently-completed West Springfield office building, located just south of the new diesel house. This building has attracted nation-wide attention because of many of the distinctive features which have gone into it. One of the most exclusive features of the building is its heating system. It is the first of its type in the country and is known as perimeter heating, a method of heating with continuous hot water radiation completely around the building on each floor . The radiation is enclosed in a continuous heating cabinet which runs completely around the building and encloses not only the fin tube radiation, but also all telephone, buzzer, inter-com and electrical conduits, so that these conduits are accessible at any point in the building. Editors of leading trade journals in the heating field have pronounced this to be the most unique heating system they have seen. All dividing partitions between offices in this building are of a movable type so that at any time the space of a particular office may be enlarged or diminished by moving a partition. No structural changes will be required, and with the heating system described, no changes in heating will be necessary, as regardless of where the partition is located the heating will be properly proportioned for the space. Fluorescent light fixtures of the latest design are also located to provide complete flexibility should any change in offices be desired. The interior decorating scheme is based on the theory of the functional use of color, in which each of the four walls of each office is a separate color, being chosen by consideration of the direction the office faces, the function of the office, and the size of the room. Particular attention was given to the color on the wall which the employee of a certain office faces so that it is soft and easy on the eyes. In all, 62 colors were used throughout the building. Several colors were used in the corridors to increase the apparent width and decrease the apparent length. Windows emitting a great amount of daylight completely surround the building. Daylight is controlled by venetian blinds and by permanent visors above the windows, shielding employees from the direct rays of the sun through most of the working hours. The principles of solar heating were incorporated in the design of these visors. Another innovation in the construction is the utilization of the sheet steel mullions between the windows to house the structural columns and all heating, plumbing and electrical piping and conduits from the basement to the upper stories of the building. This design permits the pipe to be concealed and yet it is easily accessible for future repairs. Measuring 40 feet by 140 feet, the building is of brick and concrete fire-resisting construction. It has a finished basement and two upper stories, and has all structural elements in place so that a third floor may be added at any time in the future. Just 75 feet east of the new office building a two-story 24-feet wide by 52-feet long restaurant building is under construction and will be completed within a short time. It is designed to harmonize with the architecture of the office building. The first floor of this building will be used entirely as a restaurant and will seat 32 people at one time. The second floor will have 10 bedrooms to accommodate 16 members of outlying train crews. Toilet facilities will be provided on both floors and the building will be heated by an oil-fired warm air system.

WASHINGTON HAS BIGGEST DIESEL SHIFT

Northwest Corner of State Lifted Its Wheat Fields Out of the Depression by Change-over in Power to Cut Costs in Half; Logging, Transportation Did Likewise to Give State Big Boost.

F. Hal Higgins



International TD14 diesel cleaning sand out of westland irrigation canal with bulldozer on nose as result of wind storm near Hermiston, Ore.

THE northwest corner knows its diesels. Up in the famed Palouse wheat country that lies along the borders of Idaho and Washington, your Old Reporter recalled watching the change-over taking place back in 1935 and '36 when up in the area covering the two great dams—Bonneville and Grand Coulee—being constructed. The combined harvesters still had a lot of horses and mules strung out in front of them for power as they climbed the steep hills at harvest time. One old mule skinner with a Missouri background squinted across a field at a crew that was doing a mountain-climbing job and summed it up: "Goin' 'round and 'round like the button on a backhouse door!" Farther up the road that day we spied a smashed-up combined harvester that had literally fallen out of the field when the driver failed to make a turn carefully. It was farming on the up-and-down style, it seemed to a farm boy who had been raised on the prairies of Iowa. Let's look at what those first Allis-Chalmers, International and Caterpillar diesel tractors were doing at this time. All three kinds were beginning to appear, though the Cats were a year or two ahead of the others in this area. Allis-Chalmers was leading the parade on rubber, however, and the big combines were being changed over from steel rims to rubber under the harvesters. Goodyear and Firestone factory engineers were cooperating with local farm machinery dealers to get the rubber tires on the combines, especially on the Allis-Chalmers machines, where the manufacturer and his dealers were urging and cooperating in the move. It was a startling demonstration of the place rubber was to take on all farm wheels that roll on the ground. Immediately it was seen that one size smaller tractor could handle the load; model "K's" and "M's" could handle the combine that had taken an "M" or an "L" for the same machines on steel rims. Not only did rubber tires save a lot in power, but the rubber clung to side hills and held the machine in the "lands' for a full cut of the header on steep side hill work.

Branch Manager H. W. Putnam, of Oliver Corporation, had called the attention of the writer to the cost-cutting farming revolution going on as the diesels came into the picture in 1935-'36. He pointed out that costs of plowing, disking, seeding and the other farming crop jobs were cut

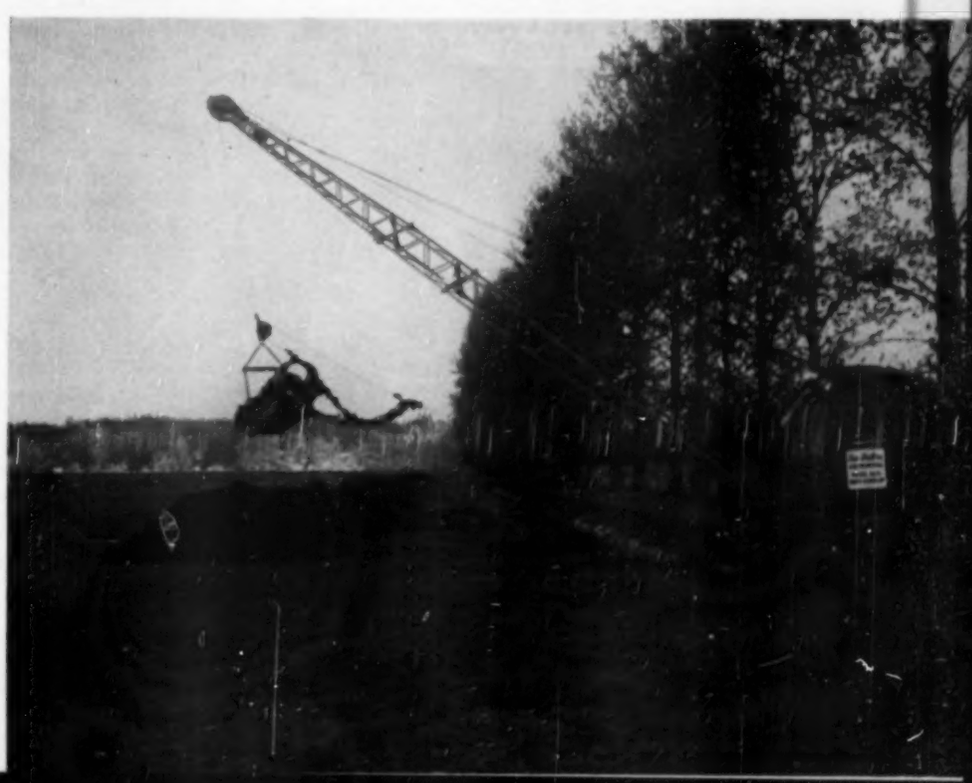
squarely in half as seen in prices quoted by custom operators of diesel and gasoline tractors. "Plowing has dropped from $3 to $1.50 an acre," Putnam said. "And it's not so long ago the price was $6 an acre, showing two 50 per cent cuts in a comparatively few years." In other words, tractors cut mulepower farming costs in half, and then diesel tractors halved this again as they got on the job.

Going back to the "Inland Empire," as the grain area of eastern Washington, Oregon and western Idaho is called, the swing to diesels has become unanimous until by war time both horses and gas tractors were very hard to find. One area around Walla Walla had taken 63 diesel tractors in one season, about 1935. This sharp swing had followed the public demonstration of the first diesel tractor on the Oregon side of the Columbia, nearly 100 miles away. But with all three state agricultural colleges participating in the final day's work on this initial diesel farm job in the northwest, the big story was spread by farm and daily press, radio and eye-witness to swing the wheat farmers to diesel tractors as fast as factory would send them up to dealers at Walla Walla, Spokane, Pullman, Pendleton, Yakima, Wenatchee and lesser wheat centers. So, your Old Reporter flew up to Washington's soil conservation program last April to again check on progress in farm mechanization in a "Farm Face Lifting Day" across the lake back of Seattle, scarcely 25 miles. In fact, this big farm event was sponsored by the Chamber of Commerce of Seattle. That will give you an idea of how the big metropolitan cities that have prided themselves on their foreign trade, mining, logging, oil booms, etc., background, as the source of their greatness are sizing up their assets today. They are all learning on which side their bread is buttered.

While there were co-sponsors in the local county soil conservation district, with forty local governmental and social organizations lined up solidly in the activities, the Big Town paid the bills for promotion and organization. And it proves to be the biggest event yet staged by the soil conservation service in the West with an auto count estimate of 20,000 present on a rainy day. In fact, rainy weather was perfect for the day in two respects: it brought out the farmers who would have felt like staying home to work on a nice day at this time of spring; and it made the water-logged farm land look like it needed the face-lift treatment for which the day was staged. "All of the work done on the Marymoor farm was fitted to the natural needs and capabilities of the soil," explained Bill Southworth, U.S.D.A. Information Specialist, who went over the projects with the visitor. "Some land is good for pastures and will probably make a fellow the most money if used as pasture. Another piece might be most profitable in trees or in grain crops, etc. The way we find out is by making a land capability survey. Our men go out into the fields with their soil augers, soil testing kits, surveying instruments, etc., and literally make an inventory of the soil. At the same time they figure out what should be done to different fields to prevent them from being damaged by erosion, water logging, in some instances alkali-accumulation, or fertility loss. Drainage, of course, is often a very important part of soil conservation as it was on the Marymoor farm. If land is being damaged by over-flow and flooding, something, naturally, has to be done. In the old days, farmers would hitch up a team and plow a drainage ditch wherever their fancy dictated. Generally, they didn't get very good drainage. Nowadays, farm drainage is a very scientific business. When our men tackle a drainage job, they fit the drains to the actual needs of the land as determined by a survey. They figure out how much water they will have to dispose of, how deep the drains should be in the soil, whether they should be of the open-ditch variety or tile, and, probably most important, how far apart they should be spaced. A scientific approach like this is bound to save the farmer money in the long run either in lower initial costs or replacement."

Parsons "Trenchliner" showing the farm "Face Lifting Day" crowd of farmers how to dig ditches to get rid of excess water on the Western Washington lands. Powered by a Waukesha engine, it was demonstrated by its owners, Watkins & Rinne.

Insley dragline demonstrating to Farm Face Lifting Day crowds at Marymoor Farm, across the lake, 25 miles east of Seattle.



ALL IS NOT LOST

The Old Iron Horse is On His Way to the Scrap Yard, But This Same Scrap is Helping to Build New Diesel Locomotives.

By RICHARD LA COSTE

DIESELS are digging a grave and, sentiment aside, nobody's sorry—not even railroad men. The grave they're digging is that of the ol' "Iron Horse." Like the ol' gray mare, the ol' Iron Horse ain't what he used to be! What is happening to the bulging behemoth of the rails? Will the shiny black giant that once awed the countryside with its whirling rods and puffing smokestack become but a memory? What will become of the old coal-burning steam engines which played such an epic role in the settling and development of America? Lastly, what will replace the Iron Horse so long associated with American romance and achievement? Diesels are the answer. And the reason is that, because of them, many railroads have turned red ink into black. But behind the unaccustomed use of black ink for red on the part of railroad men is a story of American ingenuity, American know-how, American promotion and progress. But behind the current trend toward diesels were a few far-sighted men of vision and faith in the future. They it is who are responsible for the beginning of the end of another era in American history—the laying to rest of the steam locomotive and the birth of what may prove to be the most significant transportation advance in the history of American railroad transportation.

Admittedly, locomotives have played a stellar role in America's progress for 125 years. No more. Today the trend is toward diesels. Since the end of the war, railroads have purchased some 4,700 locomotives. Of this total, 4,350 were diesels. Why? Labor costs is one reason, government controls is another. A third—a decisive factor that contributed to the switch to diesels is that they haul greater loads, use less fuel, eliminate many labor "goldbricking" practices and require less maintenance than steam sister. Let's discuss these items objectively, one at a time. In the last decade alone, labor costs have risen from 74 cents an hour in 1939 to $1.57 at the end of '49. Nor is the end in sight. "Goldbricking" on the part of railroad workers, long the envy of other trades, has increased since the war. Speaking as a veteran, this writer knows for a fact that goldbricking was practiced to the point of an art—and a national disgrace—during World War II. Lastly, labor costs have risen in direct proportion to the laxity of Congress and the lack of leadership in both Houses to contain the steady spread of goldbricking in the railroad industry. Is it any wonder then that railroad men sought an answer to lower costs? Although the diesel, from blueprint to prototype, would have come sooner or later, goldbricking prodded producers to action.

Government controls, incidentally, are a by-product of the industry. Despite the opinion of many railroad men, government controls are not necessary in the industry. With the possible exception of hard hitting Maverick Bob Young, who has done much to shake the industry out of its lethargic lassitude, few believe, however, that the railroads should be completely free. But rising costs, progressively smaller returns for investors, have forced railroad men to turn from steam locomotives to the ol' "dependable diesel."

How does the diesel compare in operating cost with the Iron Horse? Simply stated, one diesel often does the work of two, or even three steam locomotives. Costs are cut all around. So is investment in motive power. Let's look at some specific figures for a satisfying industrial eye-opener. Per-

These are the "graves" that diesels are digging for the old coal-burning steam engines that have outlived their usefulness. Costly coal strikers plus labor costs sounded the death knell of some 4,700 locomotives since war's end.

haps the most startling statement made this year on savings attributed to diesels was made by Ernest Norris, president of the Southern Railway System. Southern is heavily dieselized. Norris stated that his company last year made $22,000,000. Without diesels, he added, his company would have lost $7,000,000. Projecting his future program into present focus Southern Pacific President A. T. Mercier predicts that his company has begun a $77,000,000 dieselization program, and that the plan will save $26,000,000 a year in operating expenses alone. Far advanced in its dieselization program is the Pennsylvania Railroad. Already the company has invested $131,000,000 in diesels. Recently, it announced it had ordered another 226 of the oil-burners for its system. An unusual facet of the Pennsylvania program is that the sleek diesels are paying for themselves at a rate of 30 per cent a year. The last diesel order placed by Pennsylvania proved to be a hefty $38,000,000. This trend toward the increased use of diesels is one of the most dramatic demonstrations of mechanical development in many years. Some of the railroads are scrapping only work-worn engines. Others are slicing up large engines that were built in the early '30's—not a long locomotive life by any means. So the trend continues. Diesel progress is presaged further for the future. Freight service is only one-third dieselized. Passenger service is estimated at only 50 per cent yet to go to meet the magic 100 per cent. Railroad men forever are casting covetous eyes to further operational economies from further dieselization.

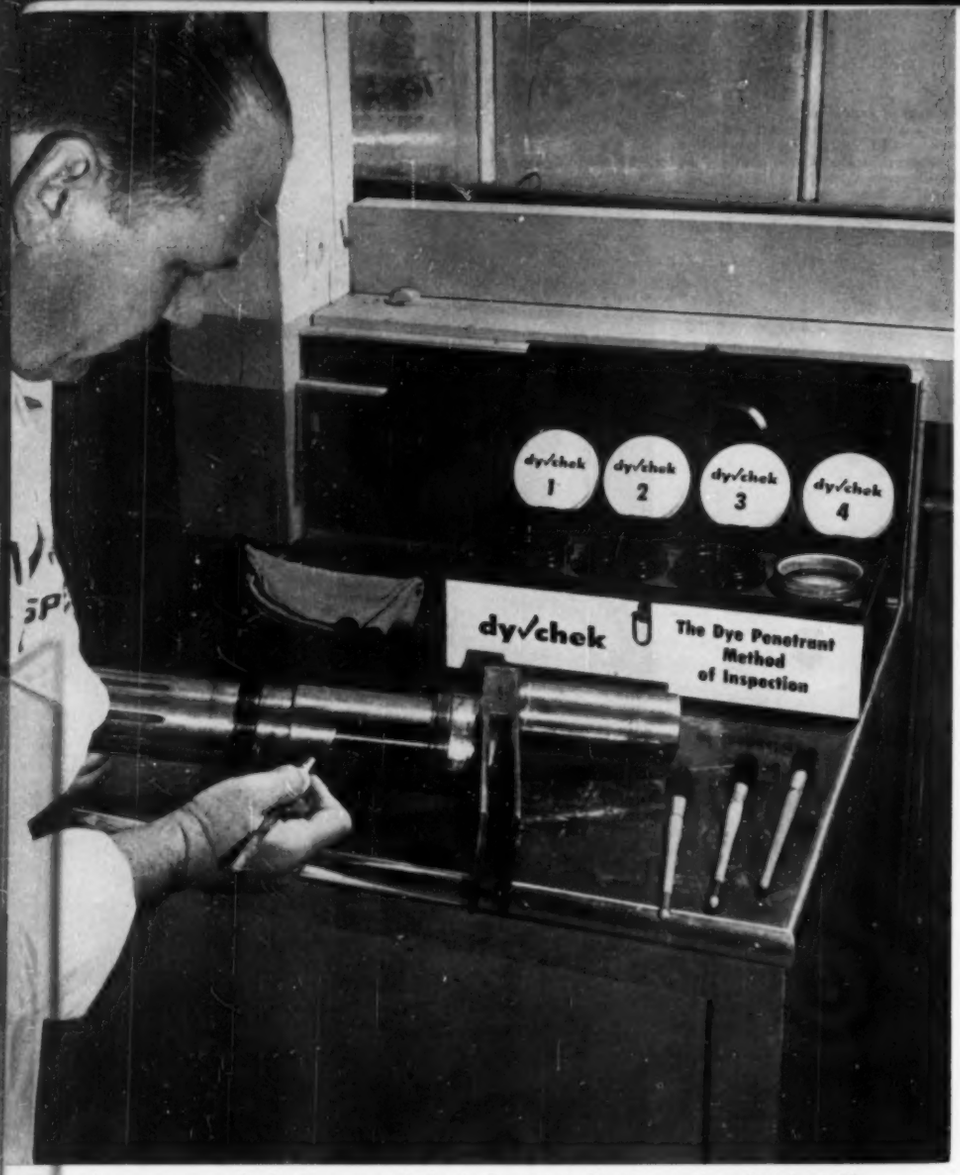
Lest the reader wonder what becomes of the ol' Iron Horses, we hastily add that their bones are properly interred, industrially speaking. Nothing is wasted, nothing lost. But ironically enough, in dying, the scrap steel that is the steam locomotive gives birth to its surging successor—the diesel. Perhaps it is prophetic or poetic—depending upon opinion—that at Weirton, W. Va., they're turning the ol' iron horses into steel. For it takes old steel to make new steel. And only a progressive outfit with vision and faith in the future could conceive and propel faith in this wise. As we go to press, Weirton already has cut up 127 of the old coal-burning "Iron Horses." Fifty-three await their turn to be scrapped. All the locomotives yield an average of 360,000 pounds of scrap each. All this took place within a four-month period. Significant of the new age is the hauling of the locomotives into Weirton by diesels. It is diesels that haul the steam-puffing locomotives into Weirton. Only they don't puff any steam any more. They are stockpiled on the Weirton Steel tracks near the slag dump below Ferry Road at Weirton Junction. From there they are pulled to a scrap field near the sheet mill or the steel works stockhouse. They are then cut up and put to torch and reduced to open hearth scrap. The scrap in turn is charged into the furnaces along with "liquid iron" from the Bessemers to make new steel.

Diesels? Who knows! Why not diesels, indeed! Yes—a new era has come. The end of an old and romantic era disappears and the dawn of a new day is born these days in the Weirton scrap yards. Sentiment aside, nobody's sorry. Diesels are in the dawn of a new day. They presage progress for the future. Away with the old, and on with the new.

Potential scrap steel. Scrap steel is the blood and bone and sinew of new steel. This once-powerful "steamer," already partially dismantled, is at the end of its "glory road." Next stop: the fiery furnaces. Left to right: Safety Captain Charles Licata and Nick Fasola, head burner—both of the Weirton Works.

End of the road. This passing parade of once-proud, steam-puffing black locomotives ends in Weirton, W. Va. At one time these "Iron Horses" played an epic role in the settling and development of America.

Scrap steel to be fed to fire-hungry furnaces. "Down in the hole" at the Steel Works Stockhouse these Weirton workers attack an engine with torches. Left to right: Tom Moore, Harold Dotson and Johnny Cattrill.



Here maintenance man applies the dye penetrant by brush. Penetrant is allowed to remain on from five to fifteen minutes. Dye penetrant is cleaned off metal surface with a special cleaner. Jars 1 and 3 contain surface cleaner and dye remover, jar 2 contains a red dye penetrant, jar 4 contains white developer.

REVOLUTIONARY NEW INSPECTION & PREVENTATIVE MAINTENANCE METHOD

By JAMES JOSEPH

A DIESEL maintenance field crew was recently a little surprised when a technician from Northrop Aircraft, Inc., started brushing a brilliant red liquid over a connecting rod. They watched as he first applied the red dye, then after five minutes wiped it clean with another solution —and finally brushed on a white, chalky liquid. Almost immediately a thin red line appeared against the background of white. "See this," explained the technician, "you've got a dangerous crack in this rod." What the diesel men were seeing was one of the first demonstrations of a revolutionary dye penetrant method for quick inspection of surface flaws. And the rods didn't have to be disassembled to make the inspection.

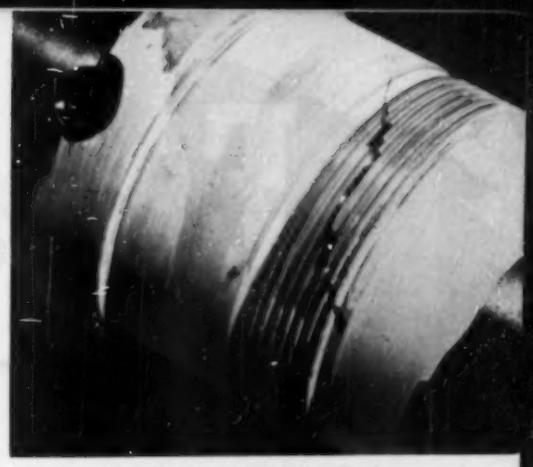
The new process—called the Dye Penetrant Method —DPM for short—was originated by Northrop Aircraft, Inc., during research and tooling for its gas powered turbine—most powerful (in excess of 10,000 shaft h.p.) propeller engine yet made. The need here—as with many similar automotive, diesel, aviation and industrial applications—was for a quick, sure method to check for flaws while parts were still assembled. These cracks and flaws were unseen by the naked eye, and only detectable by such standard methods as X-ray, ultrasonic, magnetic or fluorescent penetrant inspection- each requiring removal of parts from assembly.

The DPM system employs three easy-to-carry chemicals—a penetrant liquid of unusually high capillary attraction and correspondingly low surface tension—colored a brilliant red; a volatile solvent which removes the penetrant from the metal's surfaces; and a white developer which is a multipurpose, quick-drying solution. It provides a white background upon which the brilliant scarlet flaw indicator of the dye penetrant shows up with photographic intensity, and at the same time draws or "bleeds" out the penetrant from whatever flaws it has penetrated. Red, then, for the diesel maintenance man who adopts this new, quick method, means danger. The dye penetrant itself, a supersaturated solution, will find its way even into unseen, hair-thin flaws and work through these, from one sub-surface abnormality to another. It is probably the most probing of all known penetrants and was developed by Northrop chemists and metallurgical engineers, among them Rebecca H. Smith,

chief metallurgist for the Turbodyne Corp., a Northrop subsidiary. Diesel maintenance men—who may suspect flaws, particularly on highly stressed parts such as shafts, pistons, welded repaired sections, etc.—should find this method applicable to both field and permanent shops. The red penetrant is applied by brush, dipping, or spraying, and is allowed to penetrate for from 5 to 15 minutes, depending on the metal under test and the suspected thinness of the crack or flaw. Then the volatile solvent is used to thoroughly cleanse the red penetrant from the area. Once dry, the area is lightly painted with the white developer. This is a very fast drying, highly volatile liquid—and the results are almost immediate. As the area dries white, supplying a white background, this chemical developer "bleeds" or draws the red penetrant from subsurface areas to which it has found its way through cracks or disconformities. The outline of the flaws begin to show vividly on the white developer background. Through practice and use, a diesel maintenance man can estimate the extent—depth and width of the flaw—by the amount and shape of the red indicator which shows up on the white developer background. Because surface flaws stand out so vividly, this inspection method is particularly valuable where defects are obscured by sharp radii. It can check any diesel part which can be seen and reached by applicators—a paint brush, for instance. Such automotive parts as crankshafts, pistons, heads, connecting rods, and valves are quickly checked for surface defects—a process that takes but from 10 to 20 minutes in all.

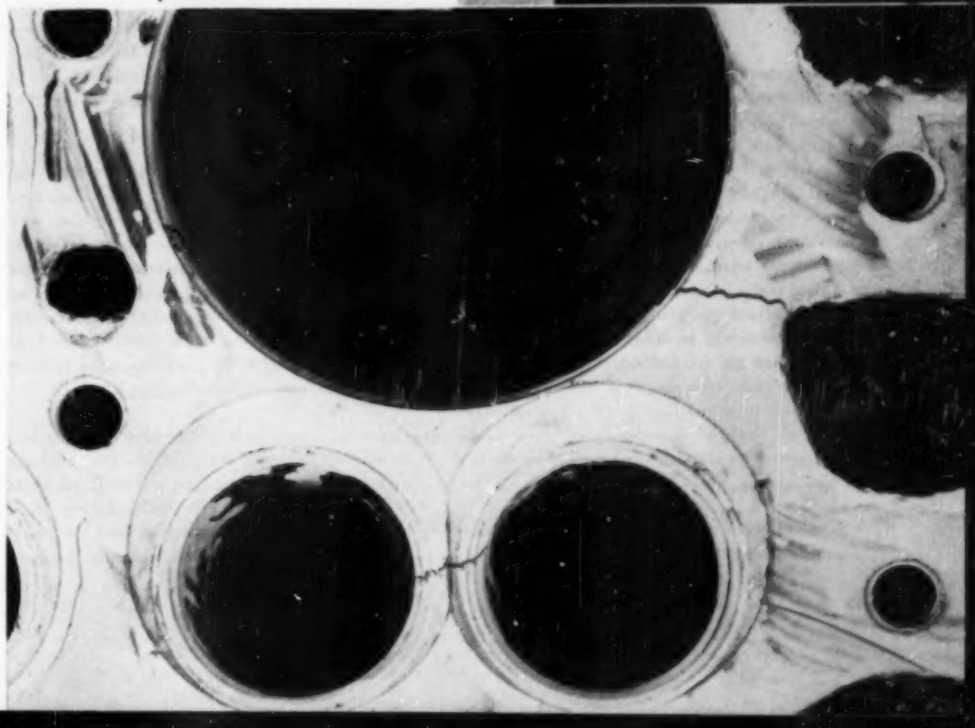
There are some limitations to the method. In the first place, only those flaws which are actual discontinuities on the surface can be checked. Thus, internal porosity cannot be found by this method unless the cavities extend to the surface. There must be a path—no matter if only micro-scopically thin—through which the super-saturated penetrant may find its way. Inclusions will not give indications even when present on the surface because they are solid and offer no crevice for the dye to enter. However, if an inclusion has caused a crack—the dye penetrant will show it. The penetrant works equally well on magnetic and nonmagnetic metals—on steel, stainless steel, nickel, nickel alloys, magnesium, titanium, copper, brass, aluminum, aluminum alloys and cobalt. There are relatively few cases where the penetrant method is not applicable—and most of these do not concern the diesel field. One, for instance, is on rough, porous grey iron castings. The penetrant is so powerful that it will go deep through the natural porous surfaces—and give indication of flaws. The method has proved successful also to test the adhesive quality of chrome plating, silver backed bearings, and where a harder metal has been brazed on a standard metal. It has both advantages and disadvantages over fluxing detection methods—for instance, the magnaflux can find subsurface flaws which do not reach to the surface. The dye penetrant requires a surface opening to allow subsurface penetration. On the other hand, dye penetrant works equally well for both magnetic and non-magnetic metals. Interpretation of the telltale red as it is drawn from the metal flaws needs only a little practice. A red line indicates a crack or cold shut; a series of red dots in a line indicate a tight crack, cold shut, or partially welded lap. The extent of the opening may be estimated by the width of the indication, or by the amount of spreading of the red penetrant on the white developer. Red dots indicate pits of porosity. A diffused pink color means that all the penetrant has not been cleaned off before applying the developer—or that the part was not adequately cleaned of dirt and scale, or that the developer was improperly applied.

Northrop does not recommend application of the penetrant process as an absolute substitute for all other methods. But it has proved in many applications a sure double-check. And in many cases it has been used alone—as the sole check. One of its chief advantages is that no false indications are possible. For instance, if a question arises whether a scratch is actually a deep flaw or a surface scratch only, the penetrant will show red if it is an actual disconformity—nothing if it is only a surface scratch. The dye penetrant treats surface disconformities which do not reach down into the metal as part of the even metal surface—and doesn't record them. Thus it is fool-proof—gives no false readings. The red-dyed penetrant is a chemically super-saturated solution—which means that the red indicator travels wherever the liquid penetrates. The bleeding is proportional to the extent, depth, width of the flaw—making interpretation easy. Fatigue cracks become obvious under its application. And as such, should be a quick check for field maintenance and preventive maintenance crews. A gallon of the penetrant will cover about 3,000 sq. ft.—the developer even more area since it is essential for best photographic reading that it be applied in every thin coatings. A day may come when no maintenance man would think of installing an axle or shaft without first applying the penetrant. Northrop is presently manufacturing various quantities of the solutions—including a handy field kit for maintenance crews . . . manufactured under the trade name Dy-Chek. For further information about this penetrant, write DIESEL PROGRESS, File 39, P. O. Box 8458, Los Angeles 46, California.



Above: Inspection. Here the white developer has been applied to the crankshaft and reveals a distinct fissure. Below: Step 3: White developer is brushed on thin. It dries almost immediately. Red line indicating flaw has already begun to appear in the threaded area.

Enlargement showing block cracks—two clearly defined cracks were found in this block when given the dye-penetrant test.



Exchange Your Diesel Maintenance Ideas

CONDUCTED BY R. L. GREGORY

Maintenance of Auxiliary Equipment on Diesel Units

CONTINUING the discussion on the above subject which was started in last month's issue, we next take up the auxiliary lube oil pumps, and the attendant filters, tanks, and piping.

Auxiliary Lube Oil Pumps

These pumps are one of the important auxiliaries, since they perform an important function of circulating oil through the lubricating system prior to starting up and after shutting down, while the engine is being cooled off. In most units the main pump used for circulating the lube oil while the unit is in operation, is driven either by a chain drive or by means of gears direct from the crank shaft. When the unit is down this pump naturally becomes inoperative.

Therefore the auxiliary pump or pump,s as the case may be, are generally separately motor driven through a gear reduction unit. The discharge piping from the auxiliary lube oil pump is usually equipped with a pressure reducing valve, which on large units is set at from 25 to 35 psi. The reason for this being that most auxiliary pumps are gear type pumps, whose discharge pressure is far above that required to circulate the lube oil through the system.

Normally there is not much that can go wrong with one of these gear pumps, providing the pump, reduction gear and motor are properly aligned on the base, with the piping properly installed and connected, and provided the lube oil is properly filtered and free from contamination. However, there is one thing that should be kept in mind, and that is, never start a gear type pump with the discharge valve closed. Several years ago while making a major overhaul on one of our units, the writer requested the plant electrician to remove the motor from the auxiliary lube oil pump, dismantle it and give it a thorough cleaning. Since it was an open type motor it had accumulated considerable dust and dirt in the windings. This we wanted removed in order to obtain a better circulation of air through the windings in the hot weather months ahead.

The motor was removed and thoroughly cleaned, reassembled, and the electrician wanted to try it out for rotational direction. For some unknown reason, when he started the job he had closed the discharge valve on the pump, which was located between the pump and regulating valve. Then he had forgotten to open it. The result was a set of broken pump gears, which had to be replaced. It is often desirable to lock this valve in the open position to avoid such a mishap.

About the only other item on the pump that should be checked is the regulating pressure valve. Most of these valves are made of brass, with a flat brass seat. In going over the maintenance program, it is well to dismantle these valves and inspect the valves and seats for pits and grooves and when found eliminate them by lapping in. All units equipped with an auxiliary lube oil pump and pressure regulating valve should have a pressure gauge beyond the pressure regulating valve. By observation of this gauge the operator can determine whether the pressure regulating valve is functioning properly.

Practically all large units operating today are equipped with some type of lube oil purifier. The type used generally depends upon either the unit manufacturer's recommendation or the preference of the plant supervisor. And since there are many good purifiers on the market, the determining factor in securing one is that of doing the job of purifying properly with not having to resort to excessive maintenance.

The majority of filters used today are those employing a cartridge type of filter, using some type of filtering agent. These filters should have periodical inspection, this period being determined by the results obtained from the purifier and by the condition in which the lube oil is kept. When an inspection is made, the purifier should be dismantled, the purifying agent removed, the body or tank well cleaned, the purifying agent renewed and the whole again assembled.

However, it is a good policy when cleaning and recharging your purifier to drain the crankcase and clean it at the same time and refill the whole system with a batch of either filtered clean oil or new oil when the old oil has been used for several months. Some plant supervisors using detergent oils add a certain amount of the detergent to their filtered oil, the amount to be added being determined by the recommendation of the oil vendor.

In our particular operation we make it a practice to send in samples of the dirty oil removed from a system, along with the filtered oil which we are replacing it with for a laboratory analysis by the vendor. In this manner we are appraised not only of the condition of the oil removed, but are also appraised of the condition of the oil which we expect to use during the period until the next oil change. This gives both the oil vendor and the plant operating personnel accurate information concerning the condition of the lubricant.

Lube oil storage tanks, for both dirty and clean lubricant, should be given an occasional cleaning out in order to minimize the chance of foreign matter lodging in these tanks. So much depends upon the lubricant and its proper function in diesel operation, that too much caution cannot be used in keeping it in proper condition.

Air Filters

Here again we have an important auxiliary in the operation of the diesel unit. Scavenging air should be clean and free from dust and foreign material. There are several types of air filters used in this connection, those predominating being the rotary screen type which pass through an oil bath, and the sectional block or air maze filters. The number used being determined by the quantity of scavenging air required for the unit operation.

The rotary type of air filters consist of a rotating screen, motor operated, an oil bath being at the bottom of the screen to pick off the foreign material deposited on the screen from the air passing through it. Most of these types of screens are not in continuous rotating motion but travel a few feet at periodical intervals, the motor control equipment being arranged to handle and operate the motor on predetermined periods. Along with this is an air blast, solenoid operated, which also periodically shoots a blast of air onto the screens.

Two important items in the maintenance of this type of air filter are to be noted. First the oil bath

must be cleaned periodically to remove accumulated dust, leaves, insects and other foreign material from the oil. In most cases, this foreign material can be removed by removing the oil from the bath container and passing it through a couple of layers of cheese cloth into a clean container. Then remove the bath container and clean it out well by steaming and drying or by washing it well with kerosene or light fuel oil and wiping dry. Another method used to clean this oil is to pass it through a batch filter when one is available. This removes all foreign material and the oil is as good as new.

The other important point is that of keeping the control switch and solenoid in proper working order. These two items are bound to become clogged with dust from time to time and should be dismantled occasionally and cleaned out.

There are several ways to clean sectional air filters. These filters consist of sections bolted into a frame work, each individual section being removable for cleaning purposes. The filtering agent is usually made up of some metal wool through which the air passes, and each section has a felt gasket or cork fibre gasket between it and the frame work to which the section is fastened. This insures a tight fit on the frame and does not allow air to seep through without passing through the filter.

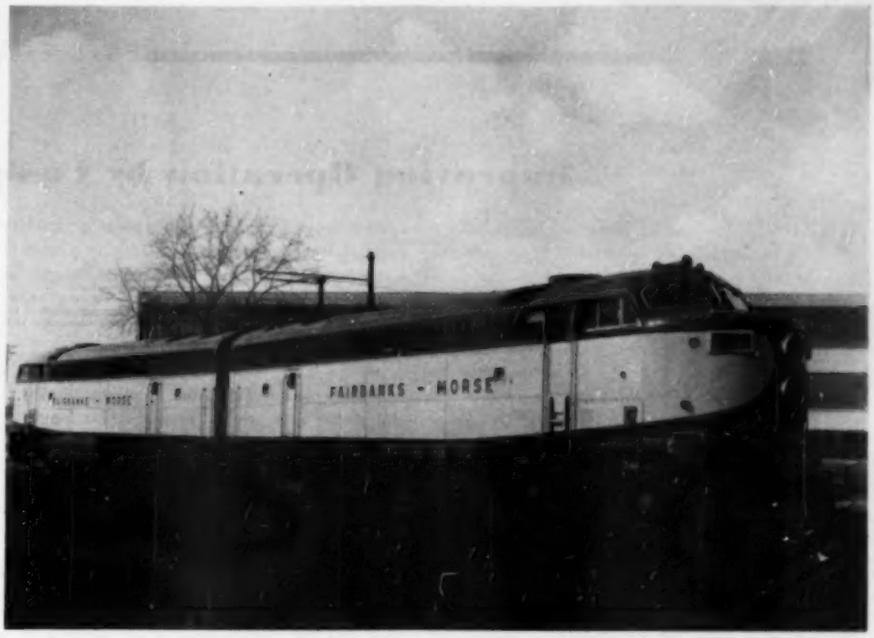
One of our units is equipped with this type of filter. When cleaning we remove the twenty-four sections, and inspect the felt gaskets to insure us they are intact. Each section is then taken and dipped in a bath of either kerosene or light fuel oil, keeping the suction side of the filter up, so that in this flushing process the cleaning agent comes up through the bottom and washes the lint, dust, leaves, etc., off the intake surface.

After all sections are thoroughly bathed, they are allowed to drain by placing the intake side down. Then each section is taken and steamed from the back so that any foreign matter is pushed through the screen from the reverse side of its normal operating position. We usually do this with about 60-pound steam pressure, since we have steam available . If steam is not available air can be used, but the cleaning action will not be as effective as though steam were used.

Upon completing the steaming process, the sections are allowed to drain again, until practically all moisture has drained off. The sections are then redipped in an oil bath, to coat the filtering agent and surfaces with oil. This is allowed to drain off back into the bath, leaving a coating on the filtering agent. The sections are then bolted back in place and the filter is again ready for use. This process should be followed at least twice during the summer season and once in the winter the air containing much more foreign matter in the summer months than in the winter, the accumulation on the screens being much heavier in the summer months than in the winter.

The October issue will contain some very important factors on air compressors and attendant equipment.

The latest in Diesel Locomotives



Is Protected by NUGENT FILTERS

The newest thing to hit the rails in diesel locomotives is Fairbanks, Morse's new 4,800 H.P. two unit passenger locomotive. This locomotive is the prototype of Fairbanks, Morse's "Consolidation Line" which will be offered in horsepower ratings from 1,600 H.P. to at least 9,600 H.P. in single locomotives. Outstanding features are high horsepower per foot of length and increased weight on drivers despite a reduction in overall weight.

In a locomotive of this type where so much depends on efficient day-in and day-out performance, it is natural that Nugent lube oil filters were selected to help protect the vital working parts of the two 2,400 H.P. engines.

Nugent pressure type filters are your best assurance of clean oil for all types of diesel power. By actual test they get out 99.8% of the dirt. Size for size they offer larger filtering area, and uniform dirt loading provides maximum efficiency and maximum life. Recharges are the inexpensive "Throway" replaceable type.

To get the long, dependable life your diesels were built to give, equip them with Nugent Filters. This is an investment that will come back to you many times over. Available for diesel engines from 1 to 384,000 H.P. in single containers.

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Supervising & Operating Engineers Section

CONDUCTED BY R. L. GREGORY

Improving Operation by Co-operation

WHILE coordinating some recent maintenance data for our plant records the other day, the door to my office opened and in walked one of the field supervisors of one of our large diesel manufacturing companies. After the usual greetings he told me that he was on a general inspection tour over the country, seeking some information, and would like to have a couple of hours of my time for a general interview and discussion of diesel problems. I naturally agreed, but the interview lasted most of the day.

The following article is an aftermath of that interview. Because of the many problems discussed and the resultant conclusions arrived at, the writer felt that we had mutually obtained some worthwhile information, and I know that I had gotten a great deal out of it, while the manufacturer's representative had accumulated some records and information relative to our plant, which would help their engineers in a survey they are making on diesel plant operation and maintenance in general. One of the principal conclusions we arrived at was that there should be closer cooperation between plant supervisors and the diesel manufacturers. It seems that many supervisors take the attitude that once a manufacturer has built, installed and placed a unit in efficient operating condition, that he should still assume the responsibility of keeping said unit in an efficient state of operation for an indefinite time. To some extent this might be true, at least to the point where the unit has been operated long enough to prove its worth. But from that time on it becomes a co-operative proposition of the plant supervisors, personnel, all working with the vendor of the unit to keep it in that condition.

We all know that local conditions play an important and vital part in this continued efficient operation. We also now that these local conditions change from time to time, and consequently the manufacturer of the unit cannot be expected to nurse it along for an indefinite period, wholly on his own initiative.

We have all met the type of supervisor or operator who, when any problem or difficulty with the unit presents itself, immediately starts cussing out the machine, the manufacturer and his engineers, and blaming them for his troubles. Thank the Lord that this type of men are few, but the fact still remains that they do exist. Then, too, there is the type of men who will cooperate in a lackadaisical sort of manner, who, when a problem presents itself, and he or some of the personnel find the cause and remedy the trouble, delights in keeping it a deep dark secret from all except those immediately involved, and especially from the manufacturer.

Now the manufacturer, his engineers, designers and service men are all human, and a long way from infallible, but it is a cinch that he will go all out on any problems, providing he has the co-operation of the plant supervisor and other plant personnel. He isn't going to waste much time with the fellow who declines giving him information accrued from daily contact with the unit.

The basis of cooperation between any plant supervisor and the manufacturer is the keeping of a complete set of records of plant conditions, operation and maintenance and make such records available to the manufacturer. If these records are available, the manufacturer's engineers and designers can go through them and from the information obtained, assuming that the records are reliable, they can, from an outsider's point of view, often lay a finger upon the cause of trouble, which the plant personnel may have inadvertently overlooked. The manufacturer's engineers and designers know for the most part the capabilities and limitations of their units, and should some condition arise which does not fit in with the efficient operation of the unit ,they will be able to spot that condition immediately, and advise the remedy.

For years we had a system which to the writer's way of thinking was a great advantage to both the plant and the vendor of the units. Whenever we had a general overhaul of one of our units, whether done under the supervision of the manufacturer's service engineer or whether we did the overhaul under our own supervision, a complete report on the job was made in quadruplicate. The original report was filed in the superintendent's office, a copy filed in the plant office, the third report went to the manufacturer for his perusal, and the fourth went to our consulting engineers, since for several years we had an engineering firm in that capacity. These reports were complete in all details. The condition of the heads, pistons, rings, liner wear, cams and cam shaft, alignment, tolerances noted, atomizers, bearings, crossheads, connecting rods, connecting rod bolts, fuel equipment, in fact, everything connected with the unit, was noted as it was taken down. Then as it was overhauled and changes made, or replacement parts installed, these were also noted. Upon reassembly of the unit, the results in operation were noted, and when this report was complete, all parties concerned had a case history of the overhaul to file for future reference.

We went even farther than that in that we kept a complete record of any maintenance or out of the ordinary condition which arose and might effect efficient operation. This, of course, was supplementary information, but it completed the picture as a whole for all concerned. As an example, we take weekly indicator cards. Suppose that a card from a certain engine shows low firing pressure or compression on a given cylinder. At the first opportunity that piston is pulled and we may find that we have one or two broken piston rings, or piston rings that have collapsed, or an atomizer out of calibration, due to one cause or another, a weak spring, sticky spindle, etc. All these points and the corrections made are noted.

To facilitate complete records, any time a maintenance job is being done we have a "work sheet" upon which we list work done. This in turn is recopied on the daily log by the operators so that all connected with the job and the operation of the unit afterward are cognizant of the facts. Naturally it takes a little time to keep such records, and some supervisors and operators are allergic to excess effort, but it is good insurance, and such information is certainly appreciated by the manufacturer and his engineers when it is available.

Now it is not the intent of the writer to criticize anyone, but if many of you were to take a look occasionally at what the other fellow is doing, you would have a series of different reactions. The writer in his early years had a "boss" who fanatically harped on his pet idea that "Anything that was worth doing at all was worth doing right to the best of one's ability." We used to get so sick and tired of hearing that on every job, but the "Boss" was right, as the years have proven.

The writer could cite many case histories of incidents and conditions where complete records properly kept and gone over have eliminated a lot of lost motion, extra outage and grief, but time and space will not allow him to go into details. Suffice it to say that with more cooperation between supervisors and manufacturers, we will have better operation and better operating units.

PHOTOELECTRIC CRANKCASE OIL TESTER

A Photoelectric Instrument for Measurement of Contamination of Crankcase Oil of Diesel Engines

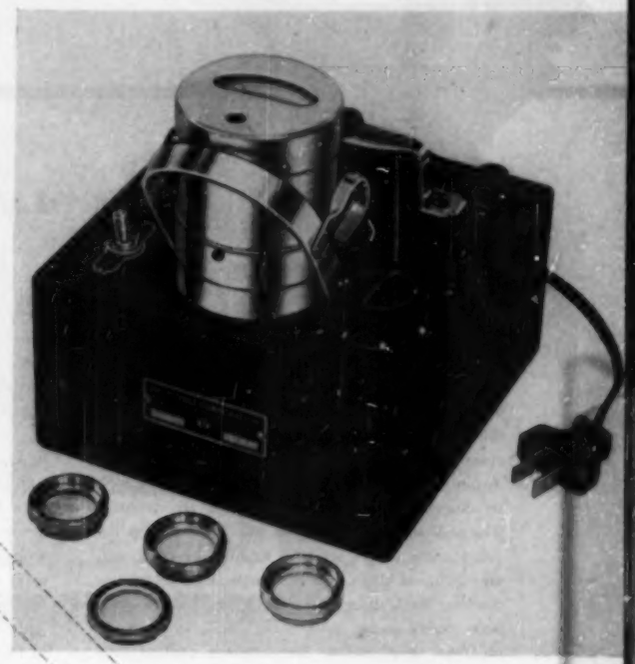
THE New Photoelectric Crankcase Oil Tester Model 75 is designed to measure the light transmission of a thin layer of crankcase oil as an indication of its degree of contamination by carbon, metal, and other foreign particles. The readings serve to show when the oil should be changed and how effective the oil filter is in keeping the oil low in contamination.

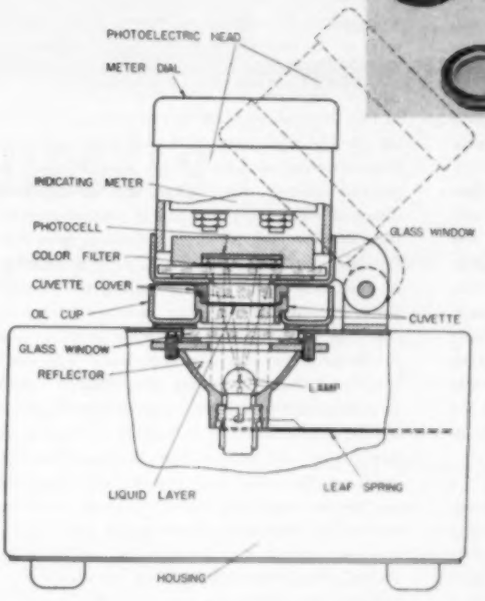
The tester is simple in operation and rigidly built for the daily requirements of practical work for automotive diesel motors as well as power plants. It is also suitable for use aboard ships. A few drops of oil are sufficient for the test which can be carried out in less than a minute. Considerable savings in oil and engine wear can be realized with the aid of the instrument.

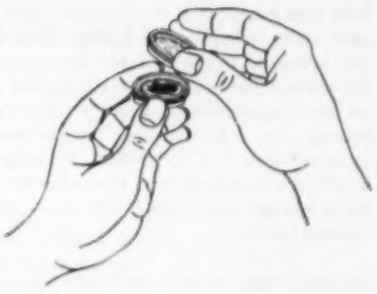
For operation, the tester can be connected either to the AC power line or to an automobile battery. The instrument can also be furnished with built-in dry-cell battery. It is then completely self-contained and can be used even where no outside current supply, is available.

The measurements are based on the action of light upon a self-generating photocell of the dry-disc type as used, for instance, in photographic exposure meters. No amplifier tubes are employed. The only part which may require replacement is the lamp, which is easily accessible from bottom.

Working Principle—A few drops of oil are placed in a cuvette, which consists of an optically flat glass disc that is cemented into a metal ring, whereby a shallow recess of a fraction of a millimeter is formed by the ring being higher than the glass. The cuvette cover is designed in a similar way, consisting of a flat disc in a metal ring, but the glass and the metal are flush. If the cover is placed on the cuvette containing a few drops of oil, a thin layer, having the thickness of the recess in the cuvette, remains between the glasses. Fresh oil appears almost colorless in this thin layer. Contaminated oils, taken from the crankcase, give the impression of various degrees of darkness.







Before inserting the cuvette, the needle of the indicating meter is set on 100 by means of a control knob. Then, the head is swung back, the cuvette with cover is placed in the tester, and the head is swung again into the test position. A clamping device presses the head down, thereby making sure that cuvette cover and cuvette are in intimate contact as required for maintaining the exact thickness of the oil layer corresponding to the recess of the cuvette. The needle will now indicate the transmission of the oil layer directly in per cent.

For practical purposes, the operator will be mainly interested in establishing certain limits of transmission to show what range of needle readings should be considered as indicating the necessity for changing oil, and what range can still be regarded as tolerable. In other instances, the user may want to have the scale divided into three ranges to be marked "good," "medium," and "bad." Suitable markings can be placed on the meter window. Also, upon request, the tester can be furnished with special dials showing whatever scale markings are desired for the particular type of work for which the tester is intended.

The tester is provided with an orange color filter which eliminates the effect of variations of color of the fresh oil. Three sizes of cuvettes are available for use with the tester, having a recess of 0.5, 0.2, and 0.1 mm. The 0.2 mm. cuvette will serve for general purposes. Highly contaminated oils, however, can be measured better in the 0.1 mm. cuvette. Conversely, samples of low contamination will give better accuracy of readings in the 0.5 mm. cuvette. In this way, the tester covers the complete range of contamination values, corresponding to about 0.001—1.0 per cent carbon, as encountered in practical work. For additional information write DIESEL PROGRESS, File 53, P. O. Box 8458, Cole Station, Los Angeles 46, Calif.

High-Speed Diesels . . . Design, Operation & Maintenance

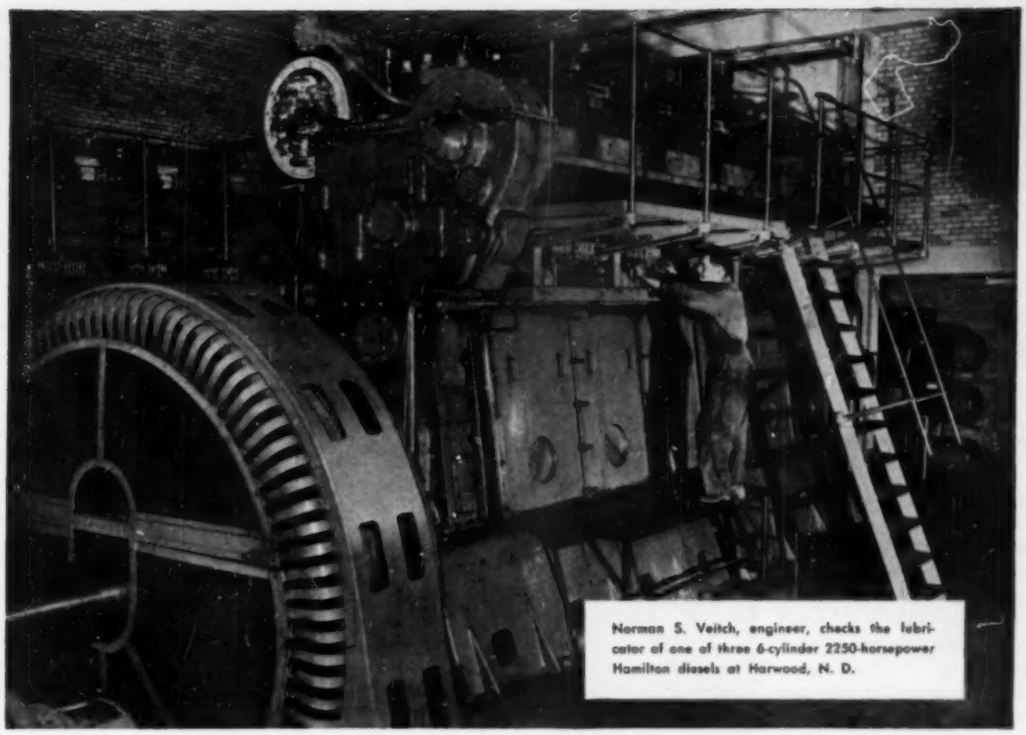
CONDUCTED BY **H. G. SMITH**

COOLING SYSTEMS, Continued

SINCE the cooling system is of so much importance to the successful operation of any high speed diesel engine, the last three articles have been on this subject. It is one thing to say that it should be watched, but it is something different when it comes to outlining what should be done when it is not functioning properly. It would be difficult to list the number of cases of engine trouble the writer has found to be due to the condition of the cooling system, and how long it took to determine the exact reason for the trouble. Through this experience he was able to help develop a few simple tests for finding the cause and an outline of them may be beneficial to many mechanics. Such things as loose or broken fan belts, leaky water pump seals, leaky connections, leaky radiators, low coolant level, frozen coolant and low engine oil level, are somewhat easy to locate and correct, but other things like clogged radiators, stuck or faulty thermostats, eroded radiator baffles, improper functioning of pressure caps, leaky cylinder head gaskets, scale in the cylinder block and head, faulty water distributing tubes, back pressure in exhaust system, improper fuel pump timing, cracks in the cylinder head or block and worn out water impellers are not found except by a more thorough test and inspection. Trouble shooting for overheating and overcooling can be greatly simplified and speeded up by narrowing down the search through logical step by step procedures as outlined below.

With the engine stopped—check the coolant level. If engine is overheated, allow to cool until boiling stops and temperature gage reads under 200° Fahrenheit. Add coolant if necessary. Inspect pressure cap (if used) and clean if clogged or replace with a new one. Check fan belt. Make a general inspection for all outside leakage. Check engine oil level and add if necessary the correct amount of oil to bring up to high level. Inspect radiator for badly bent fins or any external clogging due to dirt or leaves. Start engine and when temperature reaches 160°-180° again check coolant level and add or drain as necessary. Watch the temperature gage as engine temperature rises. No movement in the gage after a reasonable warm-up period may indicate that the thermostat is stuck open. It is also a good policy to check the gage accuracy by inserting a thermometer into the coolant in the radiator tank. Stop the engine when the thermometer indicates rated full open thermostat temperature. Wait until the thermometer stops rising and compare its reading with the dash gage. The two should be within 10°F. of each other. If they are not the gage and its bulb screwed into the engine should first be replaced. Feel radiator core for cold spots that would indicate sectional clogging. Check lower hose for collapsing when engine is accelerated. Squeeze upper hose when engine is running at high idle to check water pump pressure. Watch in radiator filler neck for abnormal rise in coolant level when suddenly accelerating engine. If rise is abnormal it will indicate air leakage into system through small leaks or the radiator may be clogged. These preliminary checks with the vehicle standing still and without any load may not prove to be sufficient; in fact, after all such conditions mentioned above are checked and corrected, a road test is essential. If overheating continues, then it is necessary to proceed further. Since there are three general causes of overheating such as (1) coolant shortage from overflow loss; (2) coolant shortage from leakage; and (3) no coolant shortage, it is necessary to determine which class is causing the trouble. To determine if it is coolant shortage from overflow loss attach a catch pot to the overflow pipe of the radiator with a rubber hose. The catch pot should have a capacity of a gallon or more and should be hung in the engine compartment or on the fender, but low enough so that when the free end of the rubber hose is placed into the catch pot there will be a gradual fall. Gradually increase severity of the vehicle operating condition and at the same time, closely watch the temperature gage and observe whether the coolant is discharging into the catchpot. Stop the vehicle occasionally, shut off engine and note the amount of coolant in the catchpot. After each stop with the engine running at fast no load speed, check normal drop in coolant level not accounted for by the amount of coolant in the catchpot to determine whether there has been any loss from leakage. If the level is out of sight, it can be checked with a rubber hose attached to the radiator drain cock. Shut off engine, remove radiator cap and hold free end of rubber hose above top of radiator. Open drain cock and slowly lower free end of hose. The point at which the liquid begins to flow from the hose is the level of the coolant in the radiator. Continue the tests but stop them before boiling. In this way you can determine whether coolant shortage precedes overheating. After several observations are taken, then pour catchpot fluid back into the radiator. The difference in level, if any, will indicate the loss from leakage. If there is no loss, shortage of coolant due to leakage can be disregarded. On the other hand, if we have leakage or loss of coolant and it cannot be located externally, it may be caused by internal cracks in the head or block, or leaky cylinder head gasket. These points should be checked before going any further, and corrected. After all the external corrections have been made and overheating precedes coolant loss, then the following things must be done: (1) Check thermostat by placing it in a pail of water and heating until thermostat opens. Put a thermometer in the water to observe the temperature at which the thermostat begins to open. The temperature should be within 5° to 10° of that stamped on the thermostat; (2) remove and clean radiator tubes; (3) replace both hose connections if found clogged or disintegrated on the inside; (4) check water pump impeller to see if it is still in good condition; (5) back flush cylinder block and head; (6) inspect water distributing tubes or pipes for corrosion or erosion. Another thing that should be checked for is air being sucked into the system or being put in the system from combustion leaks. If a water pump leaks when the engine is stopped, it will allow air to be introduced into the system when the engine is operating because the seal or packing is always on the suction side of the pump. This air introduced into the system will cause or hasten rust formation, corrosion, excess foaming and overflow loss of the coolant. To test for this air leakage attach a hose to the overflow pipe of the radiator and insert the free end, without kinks, into a small container of water. Lower the coolant level enough to avoid any overflow from heat expansion during test. If a pressure cap is used, block open the valve but put the cap on tight. Run the engine until the temperature gage stops rising and remains stationary. The test must be made at a constant operating temperature. With the engine running at high no load speed for several minutes, watch for bubbles in the water container. A continuous stream of bubbles will indicate that air is being sucked into the system, or combustion from leaky cylinder head gasket is being forced into it. If after correcting the water pump condition, further tests show bubbles, it is indicative that the combustion gases are the cause

. . . *and now please turn to page 72* . . .



Norman S. Veitch, engineer, checks the lubricator of one of three 6-cylinder 2250-horsepower Hamilton diesels at Harwood, N. D.

HAMILTON DIESELS

" . . . about as perfect a machine as we could get"

says the Chief Operator of this plant

This is the Harwood, North Dakota, plant of the Minnkota Power Cooperative. Since early 1947, three Hamilton diesels, each rated 2250 hp at 240 rpm, have been supplying 1,200,000 to 1,500,000 kwh per month to about 30,000 customers.

Mr. Helmer N. Eraker, Chief Operator since the plant began functioning, says "Considering everything, we have had a minimum of trouble. Under the job it is called upon to do, it is doing well—about as perfect a machine as we could get."

* * *

Hamilton diesels, with 21½ inch bore and 27½ inch stroke, are available with 5 to 12 cylinders. Ratings are 482½ bhp (net) per cylinder as a straight diesel and 455 bhp per cylinder as a dual fuel engine, both at 257 rpm. For full information, call the Lima-Hamilton Sales Offices in New York or Chicago, representatives in other cities, or write directly to Lima-Hamilton Corporation, Hamilton, Ohio.

LIMA HAMILTON CORPORATION

HOOVEN, OWENS, RENTSCHLER CO. **HAMILTON, OHIO**

A division of the Lima-Hamilton Corporation

WHAT'S GOING ON IN ENGLAND

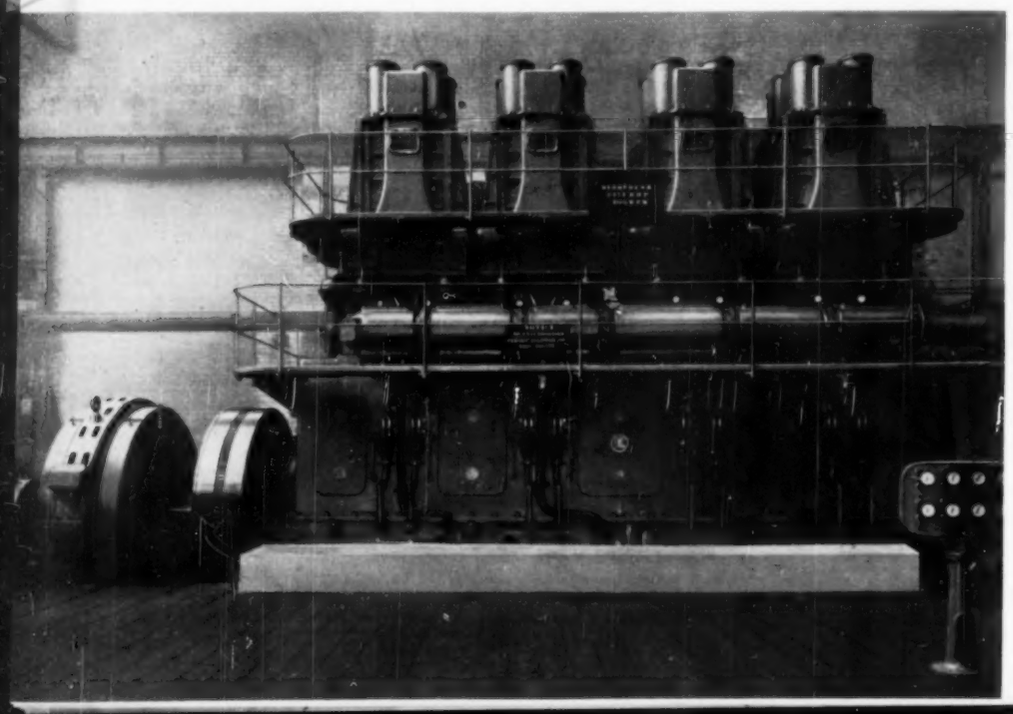
CONDUCTED BY **HAMISH FERGUSON**

Hamish Ferguson was appointed Secretary to the Diesel Engine Users Association in London in 1944. Previously senior technical assistant to Diesel and Insurance Consultants, London, and for several years with English Electric Company in the designing and erection of large diesel generating plants. Mr. Ferguson continues to do independent consulting work.

THE English Electric Company has just completed another Fullagar diesel generating set for the Bermuda Power Station. This engine is of the opposed-piston two-cycle type, the unique mechanical feature being that in each pair of cylinders the upper piston in one cylinder is connected to the lower piston in the adjacent one through oblique rods, thus making the engine in effect a double-acting two-stroke, yet requiring only one crank per cylinder and resulting in a compact engine. Having eight cylinders, 19-inch bore by 22-inch stroke (combined stroke 44 inches) the engine develops 3,275 bhp. at 200 rpm. and will be direct-coupled to a 2,300-kw. alternator. This is the third engine of this size to be supplied and the station already contains five of the smaller type Fullagars having a cylinder bore of 14 inches.

Bryce Fuel Injection Ltd. has recently acquired the rights to manufacture the ingenious Berger starter which is capable of application to engines of all types, but particularly useful in the case of diesels. It will be known as the Bryce-Berger Handraulic Starter. Working within a closed circuit, it relies on no outside source of energy and it has only three moving parts—two toothed racks and a pinion. The heart of the starter is the hydraulic accumulator which consists of a small reservoir containing a synthetic rubber diaphragm. The reservoir is filled initially with air compressed to approximately 2,000 psi. and it is then sealed. As there can be no leakage and the air is not consumed, the accumulator never requires recharging with air. When air only is in the accumulator, the diaphragm rests against the inside walls of the reservoir. Hydraulic fluid is pumped into the lower part of the accumulator by means of a hand-operated pump and this compresses the air at the back of the diaphragm to approximately 4,000 psi. The diaphragm completely isolates the air from the fluid and in its charged state the pressures on both sides of the diaphragm are equal and it is not, therefore, subjected to any strain.

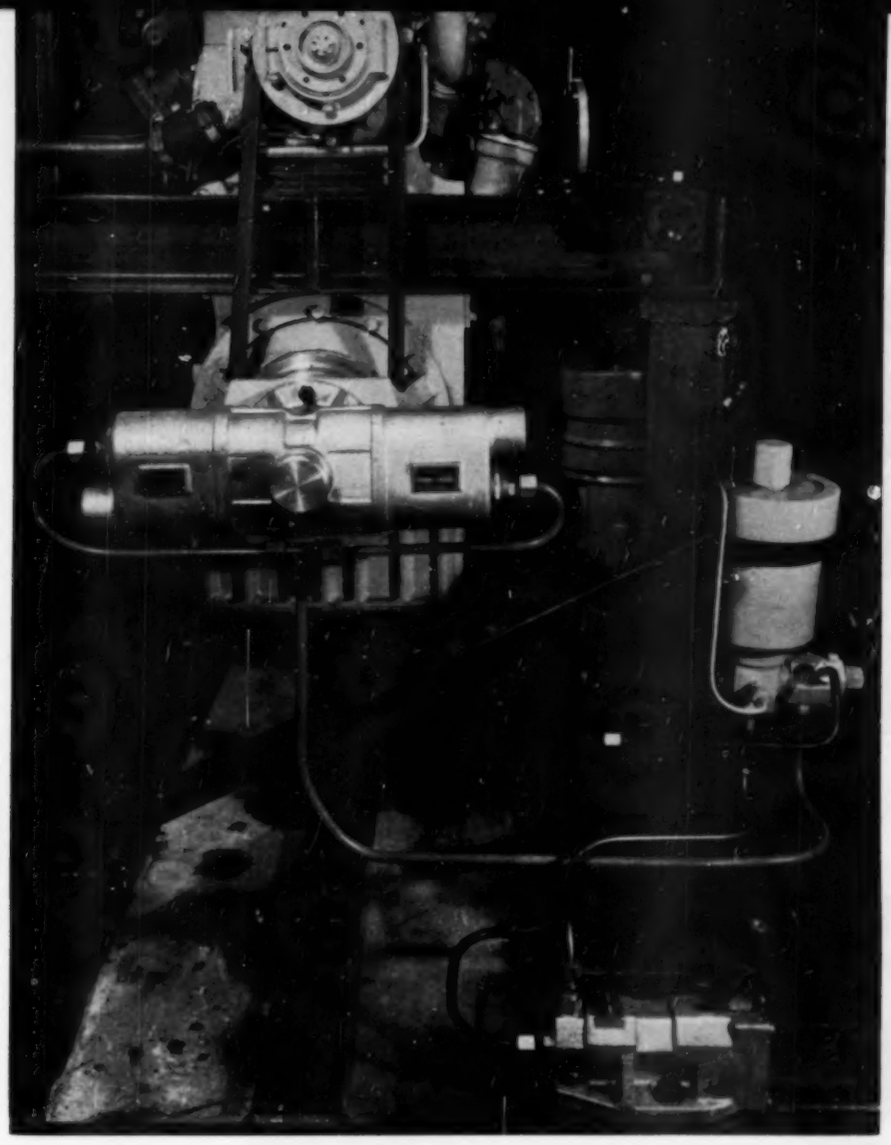
The starter unit itself comprises two opposed cylinders, each containing a piston-rack which engages with a corresponding dog on the engine crankshaft. The teeth of the pinion and racks are helical so that a forward movement is imparted to the pinion, thus engaging the dogs during the first stage of the starting operation. On releasing the control lever, the energy stored in the high pressure air in the accumulator is transmitted through the medium of the hydraulic fluid to the starter. The control lever operates a two-stage valve, the first stage admitting sufficient pressure to the starter to engage it with the crankshaft. During the second stage, when the dogs are fully engaged, oil at full pressure is admitted to the heads of the piston-racks and the crankshaft is rotated at high speed and with a high starting torque. The action of the starter resembles a sharp pull up on the starting handle but it is applied with considerably greater speed and torque.



When the engine starts, the dogs are automatically disengaged and on the release of the control lever, the piston-racks return to their original positions under the influence of return springs, thus discharging the fluid to the feed tank ready for pumping up to the accumulator for further starts. Building up the fluid pressure in the accumulator, which is not always necessary after every start, is normally carried out by means of the hand pump. This is easily operated and it takes no more than a minute or so to recharge the system. If desired, a small mechanical pump can be fitted so that, once the engine has started, the accumulator fluid pressure will be recharged automatically.

An interesting feature of the device is that by using only the first stage of the operating valve the engine can be "inched" over as may be required for timing purposes. The starter can easily be fitted to existing engines and it can be incorporated in new engine designs without difficulty.

The second edition of the British Diesel Engine Catalogue has recently been issued. This is the British counterpart of the U. S. A. Diesel Catalog and it contains a wealth of well-coordinated detail relating to British-built engines.



Berger Starter

(A) Driven pinion with helical teeth.

(B) Piston-racks driving pinion A.

(C) Hydraulic fluid inlets.

(D) Piston-rack return springs.

(E) Driving dog on common shaft with pinion A.

(F) Driven dog on crankshaft.

(G) Axial thrust due to helical teeth of piston-rack and pinion.

(H) Starter Mounting Flange.

(J) Hydraulic Accumulator.

(K) Diaphragm containing compressed air.

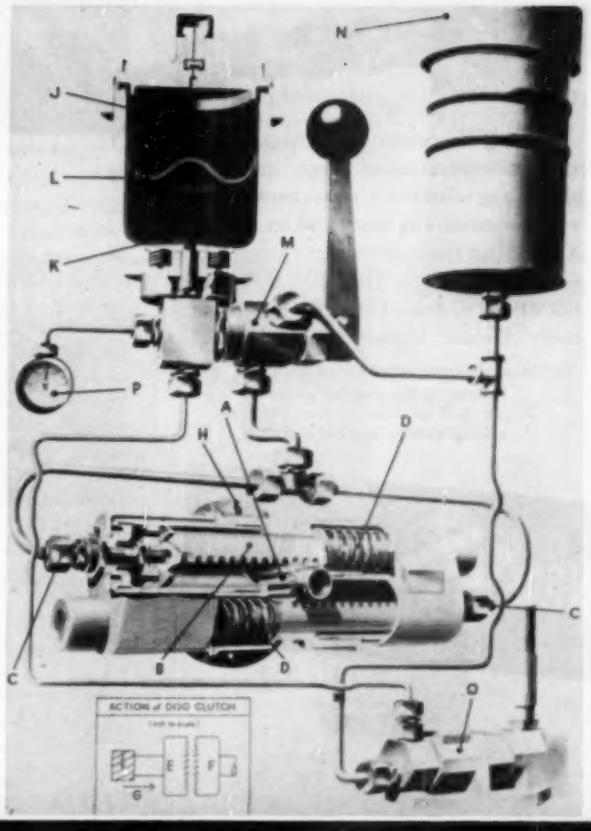
(L) Diaphragm under hydraulic pressure.

(M) Relay starting valve.

(N) Hydraulic fluid reservoir.

(O) Hand pump for charging accumulator.

(P) Pressure gauge.



As advertised in TIME and NEWSWEEK

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NEW YORKERS HAVE THAT POLISHED AIR. If you're the type who likes clear, clean air, beware of men with shiny shoes! Tests made in New York City indicate that polishing and wear reduce hundreds of tons of shoe polish to dust there every year.

CLEAN AIR BY THE DRAWERFUL. Electromaze electronic air filters stop fine dust, pollen and smoke. Filter cells slide in and out like file cabinet drawers for easy servicing. "Building block" construction allows greater flexibility in size.

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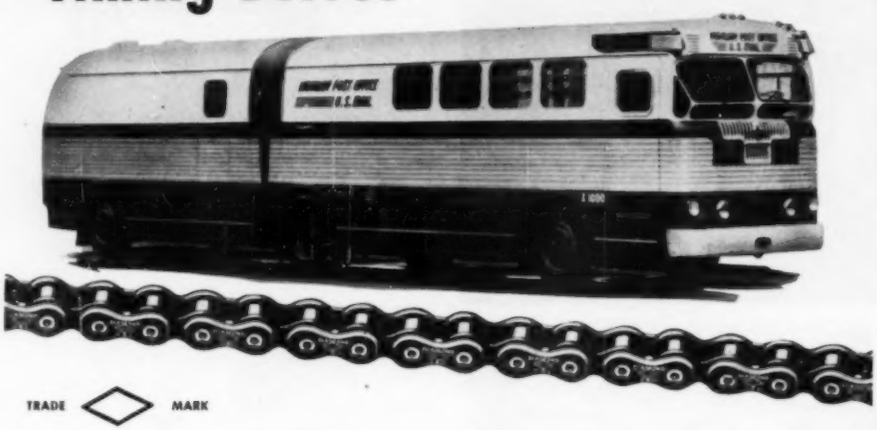
Dual Fageol Twin Coach engines (360 h.p.) power the SuperTwin located below floor and equipped with automatic transmission. . . . The engine Timing Drives are Diamond Roller Chains.

DIAMOND Roller Chain Timing Drives



TRADE ◇ MARK

On the rapidly expanding fleet of the articulated giant SuperTwin Trucks, high precision Diamond Roller Chain Timing Drives help insure the dependability of Fageol Twin Coach engines.

In referring to over-all efficiency of the engines, the maker says, "The engine's high efficiency is naturally contributed to by the minimum loss to friction when using the roller chains for the driving of camshafts and accessory units."

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Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND ROLLER CHAINS

Combination Pyrometer and Motor Driven Switch

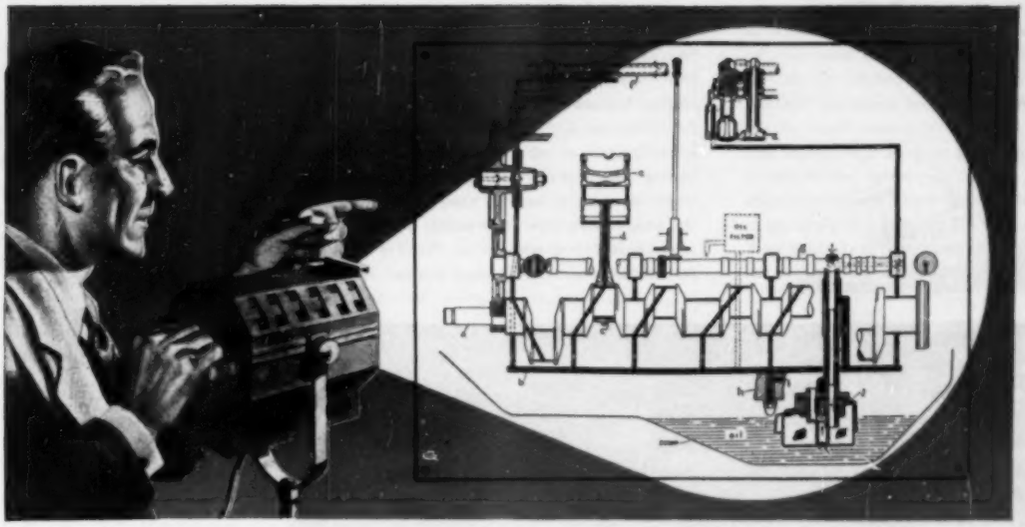
Illinois Testing Laboratories, Inc., in the past few months has made available to the diesel industry a new combination pyrometer and motor driven switch that is continuously able to monitor exhaust temperatures. Alnor engineers utilize the style of assembly wherein telephone type relay contacts are closed by action of a motor driven roller arm. The contact leaves are mounted radially upon a machined aluminum ring having a heavy cross section to provide mechanical stability. Small cylindrical plungers, distributed around a central circle in the ring, are placed so they can slide through holes in the ring and thus close the contacts. The motor shaft is mounted concentrically with the ring so that it drives the roller arm around the previously mentioned circle of plungers. A roller arm carried on the outer end of the roller arm presses upon each plunger and moves it against the contact leaves, causing the contacts to close.

The switch and pyrometer is sealed side by side into a completely flush type steel case. This eliminates dirt from the mechanisms and provides magnetic shielding for the pyrometer to eliminate errors due to stray magnetic fields. The inclusion of this new "Alnor" product on a diesel engine eliminates the operator's procrastination of switch operation. For further details, write DIESEL PROGRESS, File 43, P. O. Box 8458, Los Angeles 46, California.

Jack Hause Named G.E. Transportation Manager of St. Louis Office

Jack Hause

Jack Hause, of Erie, Pa., has been appointed manager of the transportation division of General Electric's St. Louis office, headquarters of the apparatus department's newly-formed Mid-States District. The announcement was made by G. F. Maughmer, district manager. Hause joined G.E. in 1937 and for two years was assigned to general sales engineering work in Washington, D.C. In 1940 he moved to the company's locomotive & car equipment divisions at Erie, Pa., where he specialized in mine and industrial locomotives and railroad-type electric and diesel-electric locomotives. Prior to his new appointment he worked as an application engineer on the new ALCO-GE gas turbine electric locomotive. Hause graduated from the University of Louisville in 1934, later obtaining a master's degree in engineering, specializing in electric transportation, from Purdue University in 1937. He will reside in St. Louis.



Man with a new light on your DIESEL LUBRICATION

EVEN THE NORMAL EFFECTS from compression, combustion and load make it tough enough for any Diesel engine oil. Yet in addition you want to be sure your Diesel oil will be master of special needs —sometimes imposed by particular mechanical conditions . . . or by fuel characteristics, load or even by factors of climate and altitude.

You'll get a new light on this whole range of lubrication complexities, as it affects your own Diesels, by calling in a Cities Service Diesel Lubrication engineer. He is qualified to tailor a Diesel lubrication program that will contribute to maximum hourly output and sharply lower costs. Like scores of other Diesel operators throughout industry you can profit by drawing on the knowledge and experience of a Cities Service Diesel specialist. Contact the office nearest you, or return the coupon below. It brings details – plus a valuable Diesel booklet, free.

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New York 5, N. Y.

Please send me without obligation your new booklet, "Diesel Engine Lubrication."

Name_____
Company_____
Address_____
City_____ State_____

High Speed Diesels . . . *continued from page 66*

and it must be corrected. In recent years there is another possible source of trouble that the cooling system is subject to, and that is the oil cooler unit inserted in the system for keeping the engine oil at the proper temperature. If any failure of these units occur, the engine oil will leak into the cooling system quite rapidly because of the oil pressure. Engines so equipped should be watched. Failure can be immediately spotted from oil deposits in the upper filler neck of the radiator and if the leakage is serious, the coolant will be forced out of the overflow pipe, where it will be readily observed. Since the oil in diesel engines turns black very quickly, this oil deposit in the filler neck will be a dark color and distinguishable from the usual corrosion inhibiters used. The design of these coolers is excellent, being factory tested under pressures far exceeding any engine oil pressures, so that failures will be very few.

New Siloo-Loosite Distributor

Announcement has been made jointly by Petroleum Solvents Corp., of New York City, and Wilkening Manufacturing Co., of Philadelphia, that the Siloo and Loosite products of Petroleum Solvents Corp. now are distributed also by the Wilkening organization, makers of Pedrick piston rings. Petroleum Solvents Corp. continues, as in the past, to distribute its products through its own organization. It is pointed out that the Wilkening distribution means additional outlets, and is not intended to conflict with established merchandising practices of Petroleum Solvents Corp.

These products, as sold through the Wilkening organization, will carry the Pedrick trade name along with Siloo and Loosite. Featured in the Pedrick line now, therefore, are the following: Pedrick-Siloo is a solvent that is said to be fast-acting, safe and effective in keeping engines clean inside. It is claimed to prevent accumulation of sludge and gum, keep piston rings and valves free, and to protect bearings from corrosion. It is recommended also for tune-up and break-in. Pedrick-Loosite is a highly concentrated solvent for de-sludging engines, cleaning out accumulations of gum and sludge, inhibiting corrosion and neutralizing acids. Pedrick-Siloo for Gas Tanks cleans out fuel lines and keeps them free of gum, rust, corrosion, freezing and clogging. It is added to the fuel in the gas tank. Pedrick-Siloo Diesel-Fuel Conditioner is designed to eliminate clogging of injectors ,hard starting, excessive smoking by keeping the fuel lines clean and aiding combustion in diesel engines. It is said not to affect the cetane rating of the fuel. Pedrick-Siloo Penetrant is a combined solvent and penetrant. It acts as a rust remover, rust inhibitor and gum remover. It is claimed to loosen almost anything that is frozen from rust, corrosion or gums. Pedrick-Siloo, Pedrick-Loosite and Pedrick-Siloo Penetrant all contain Trileum, a substance which the makers say increases the lubricity of oils, intensifies the penetrating quality of lubricants, speeds the action of solvents and helps oil to resist heat.

centrifugally cast
CYLINDER LINERS BY
CWC
✓Excellent — material and dimensional consistency assured by permanent mold casting process.
✓Excellent — machinability with high Brinell.
✓Excellent — wear resistance due to uniformity and density of material structure.
✓Excellent — resistance to corrosion through the use of alloys.
Write for our new brochure SCIENCE IN THE FOUNDRY. It gives complete information on centrifugally cast cylinder liners and on all other CWC products such as: cast cylinder blocks and heads; cast pistons; cast camshafts; cast crankshafts; cast gears; centrifugally cast Centrifuse brake drums; and a large variety of steel castings.
CAMPBELL, WYANT & CANNON FOUNDRY CO.
MUSKEGON, MICHIGAN
CAMPBELL, WYANT AND CANNON FOUNDRIES
MUSKEGON, MICHIGAN
Henry Street Plant • Sanford Street Plant • Broadway Plant
LANSING, MICHIGAN • Centrifugal Fusing Co.
SOUTH HAVEN, MICHIGAN • National Motor Castings Div.
CWC

Allis-Chalmers Works Manager

Hugo W. Liebert **John Ernst**

Hugo W. Liebert, general works manager of six tractor division plants of the Allis-Chalmers Manufacturing Company, retired from active service with the company June 30, 1950, according to W. A. Roberts, executive vice president. Liebert recently completed 43 years with Allis-Chalmers, having progressed through various supervisory positions until his appointment as general works manager March 1, 1942. During his years with the company Liebert made many contributions that played an important part in the successful expansion of the tractor division's nationwide manufacturing operations.

Simultaneous with this statement, Roberts announced the appointment of John Ernst to succeed Liebert as general works manager. Ernst joined the company 33 years ago and has accumulated an intimate knowledge of the company's manufacturing problems. He served his apprenticeship as a tool and die maker and rose through various supervisory posts to that of assistant general works manager of all tractor plants.

Reorganization at Baldwin

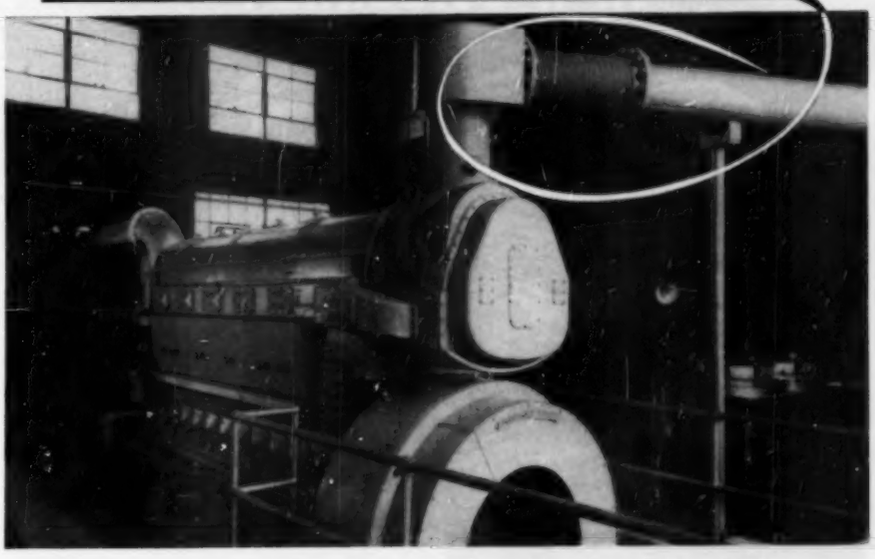
R. B. Crean

R. B. Crean, newly-elected vice president in charge of apparatus sales at The Baldwin Locomotive Works, Eddystone, Pa., has inaugurated a reorganization policy designed to strengthen all phases of the promotion and sales of the company's products and to offer improved service to its customers in the railroad, materials testing, metal working, plastics, power generation, and marine fields. To further these objectives, Mr. Crean has made a number of appointments and functional changes in the company's sales organization. E. R. Wisner, who has had a number of important assignments since joining Baldwin in 1947, has been appointed manager, locomotive department, in which capacity he will direct the sales activities in connection with complete locomotives of all types. E. F. Sheehan, formerly concerned only with the sales of diesel renewal parts, has been named manager, renewal parts department, and the scope of his activity has been broadened to cover the sale of renewal parts for both diesel and steam locomotives. Andrew Liston, manager, hydraulic turbine and marine products department, will continue in this capacity, and in addition, will have charge of the sales of all foundries products and the handling of negotiations with the U. S. Government on special products. M. L. Hall, formerly manager, testing equipment sales, has been appointed manager, testing equipment department, in which capacity he will have complete responsibility for the operation of this phase of Baldwin's activities. George F. Walsh, who has been sales promotion manager, testing equipment department, has been named sales promotion manager, and his activities will cover the promotion and advertising of all product groups. R. G. Tabors will continue as manager, hydraulic press and power tool department; and R. S. Oberlander as manager, diesel engine department, as at present. J. V. Breen has been named manager, order service section; and R. Zerewat, manager, market research and statistics.

Demonstration of New Tool Bars

Early this year Caterpillar Tractor Co. announced the availability of tool bars for use with integrally mounted tillage tools on its Caterpillar D4 Tractors to meet demands for an attachment to help the rancher and farmer do more efficient work in less time and with less effort. Now, working closely with its dealers throughout the west, Caterpillar is sponsoring a mobile unit which is giving daily demonstrations so that ranchers and farmers may see this new product for themselves. Employing a Martin "Carryhaul" Trailer, carrying a D4 tractor and an assortment of tool bar arrangements, including John Deere-Lindeman disk-harrow, and John Deere lister, disk ridger, spring shank cultivator, rigid shank cultivator, chisel, ditcher, and subsoiler, a team demonstrates various attachments at scheduled times and places. These demonstrations offer guests the opportunity to evaluate for themselves the greater ease of operation over the towed implement method of tillage, since integrally mounted tools may be lifted quickly for short turns at the end of rows, for backing up to work out from fence corners and ditches, and may be carried by the tractor for maximum handling ease. The tool bar can be adapted to either the 44- or 60-inch gauge tractor. The 44-inch gauge tractor is used in the demonstrations. The western demonstration unit is one of three currently touring the entire United States. For further information write DIESEL PROGRESS, File 49, Box 8458, Los Angeles 46, Calif.

MAINTENANCE FREE



CMH Flexible Connectors for Internal Combustion Engines

Connector problems for internal combustion engines are solved efficiently and safely when you use CMH Flexible Connectors. They absorb expansion and contraction . . . correct for misalignment . . . control vibration. CMH Flexible Connectors require no maintenance—all metal connector and coupling assembly needs no packing, does not leak. Safe, dependable and long-lived for exhaust lines or air intake. Available in choice of steel or stainless steel with flanged or welding ends. Standard diameters from 1 inch to 30 inches.

In its complete line of flexible metal hose products CMH also manufactures lines for fuel, oil, compressed air, water, lubrication, etc. Write for complete information.

Whatever the application, CMH Flexible Connectors give dependable service. In the installation pictured the connector is being used in the intake line to the scavenging blower of this diesel.

Flexon identifies CMH products that have served industry for over 40 years

CHICAGO METAL HOSE Corporation
1325 S. Third Avenue • Maywood, Illinois • Plants at Maywood, Elgin and Rock Falls, Ill.
In Canada: Canadian Metal Hose Co., Ltd., Brampton, Ont.

CMH ONE DEPENDABLE SOURCE
for every flexible metal hose requirement

Sales Representative Appointed for Nickel Cadmium Battery Corp.

Gordon H. Proffitt, with offices in the Matson Building, 215 Market St., San Francisco 5, Calif., has been appointed sales representative for the Nickel Cadmium Battery Corporation, according to an announcement by A. B. Strange, treasurer and general sales manager. He said that Proffitt will serve all markets for Nicad Storage Batteries, including railway diesel lovomotive starting, marine, utility and highway truck and bus services. Mr. Proffitt was graduated in engineering from the University of California and was formerly associated with the Standard Oil Company of California and the federal government in engineering work. Since 1940 he has been a manufacturer's representative for marine, railway and industrial equipment. J. P. Williams, Jr., who has been active in the transportation field for 17 years, is his business associate.

Highway Facilities Inadequate for Motor Transport

America's traffic crisis will continue as long as we keep building motor vehicles faster than we build roads, E. D. Bransome, president of Mack Trucks, Inc., declared recently. Mr. Bransome called attention to the recent testimony beforé a Senate committee by Thomas H. MacDonald, Chief of the Bureau of Public Roads, Department of Commerce. Commissioner MacDonald told the Senate Public Works Subcommittee which is holding hearings on the federal aid road bill that only about 10 per cent of the annual cost of new vehicles is being spent on maintenance and construction of highways. "Antiquated highways," the Mack executive said, "are responsible for much of the overcrowding of roads. These highways were built in another age to meet other conditions. The only solution is to bring the roads up to the standards required by modern traffic conditions."

New Radical Design Plastic Metal Screw

A new composite fastener is a radical design change in electrical, vibration isolating and thermal insulation uses. Called the Forman insulating screw, this new fastener is comparable in strength and accuracy to a standard metal screw, and is claimed to have the additional advantages of electrical insulation, shock resistance, and vibration damping. The first obvious advantage is the considerable saving in parts and assembly time when the insulation is an integral part of the fastener. It has already been used, and will probably find greater use in the manufacture of electrical components; in the chemical process industry; and in the design of mechanical assemblies. A typical product illustrating the advantages of the Forman insulating screw is an electrical relay, in which four of the new screws replaced 18 parts formerly used.

Basically, the new fastener consists of a serrated metal core which has been extrusion-coated with a thermoplastic material. The type of core and plastic used depends entirely on the use to which the screw will be put. After the extrusion process the resulting composite rod is cut in an automatic screw machine to form accurate threads and a strong head. The metal core runs the entire length of the screw and furnishes most of the screw strength. The plastic exterior gives the new screw all of its extra insulating and sealing qualities. The metal core carries the torque applied by a screw driver or other driving instrument. There is no danger of the plastic chipping or cracking under torque. In addition to the already named insulating properties, two other qualities are significant: (1) The unlimited colors offered make production coding simple; and (2) the plastic threads, when used with a metal nut, tend to seize and form an effective lock—eliminating the need for lock washers or lock nuts. For further information write DIESEL PROGRESS, File 51, P. O. Box 8458, Los Angeles 46, Calif.

WHY, THE MAN HAS HOLES IN HIS HEAD!

You can't protect yourself against a mid-winter storm with a light summer suit . . . and you can't protect your fuels and lubricating oils with inadequate filters. It's as simple as that. Yet, there are some men who try. They try because they think they can save a few pennies, but instead of making a saving, sooner or later they lose their shirts . . . right out from under their linen suits.

When you're in the market for filters . . . it pays to ask a few questions. How much dirt will the filter actually stop? After it stops the dirt, can the filter hold it? Is the element designed to filter really *dirty* oil, or just *clean* oil? Is the element designed so that its surface will continue to provide efficient filtration over a reasonable period of time, or will it quickly become clogged and coated and cease to serve its purpose? Is your particular job adequately performed by just one filter, or should it require more than one? And last but not least, are you getting the *right size* filter to give your equipment sufficient protection?

Winslow elements are built to filter *dirty* oil, to eliminate *the dirt that hurts*. They aren't laboratory filters. They are filters built for hard, day-after-day service in actual operation. They save you *dollars*, not *pennies*.

Winslow Filters eliminate the largest particles of dirt first, and then progressively catch and *hold* smaller particles as the oil passes inward toward the center core. There is no premature clogging, no buckling of the element, allowing dirty oil to by-pass it.

If you are interested in complete safety and satisfaction, with lasting economy, write to Winslow today for further details.

WINSLOW FILTERS

AD W 502 Winslow Engineering Company 4069 Hollis Street • Oakland 8, California

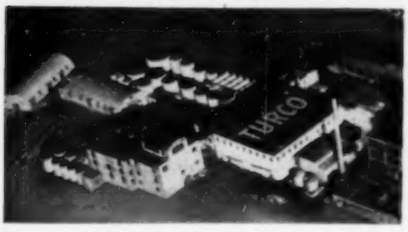
Sales Promotion Manager at Baldwin

George F. Walsh

R. B. Crean, vice president in charge of apparatus sales, The Baldwin Locomotive Works, Eddystone, Pa., has announced the appointment of George F. Walsh as sales promotion manager. His activities will cover the sales promotion and advertising as well as general publicity for all product groups.

Mr. Walsh was born in Philadelphia in 1916, and started his business career in 1940 with the Electric Storage Battery Company, where he held the position of sales statistician. In 1945 he left Exide to become assistant district sales promotion manager in the Middle Atlantic District of Westinghouse Electric Corporation, and in 1947 became affiliated with the Willard G. Myers Advertising Agency in Philadelphia as copy director. He came to Baldwin in 1948 as sales promotion manager, testing equipment department, which position he held at the time of his recent appointment. Mr. Walsh is a graduate of the Charles Morris Price School and took specialized training at St. Joseph's College, the University of Pittsburgh, and Carnegie Institute of Technology. He is a member of the Eastern Industrial Advertiser's Association.

Eastern Plant Acquired by Turco



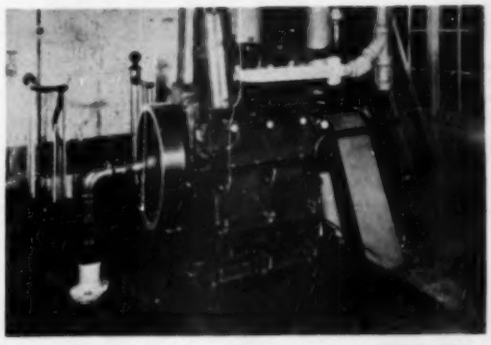
The acquisition of a large eastern plant as a major step in a continuing expansion program was announced by Turco Products, Inc., manufacturer of industrial cleaning compounds. The new facilities located at 120 Lister Ave., Newark, New Jersey, will serve as a manufacturing and laboratory center for Turco's Atlantic Division. Present manufacturing maximums will be approximately doubled by the six major buildings covering 58,000 square feet and by the 950,000-gallon storage capacity of the new three-acre site. Ideally located adjacent to the Pulaski Skyway and the main line of the Pennsylvania, the new factory has an in-the-plant spur line connecting to all major rail facilities, as well as complete dock and lighterage facilities on the Passaic River.

A group of key executives is already at the scene, engaged in working out the details to have the factory in production by September 1. Turco's president, Mr. S. G. Thornbury, will spend several months in the East rearranging delivery schedules with customers previously supplied from other points and personally negotiating contracts with large volume users of materials whom the plant will serve more speedily and economically. Sidney E. Smith, of Los Angeles, has been appointed general manager in charge of the Atlantic Division factory at Newark. With him is A. H. Dekker, Turco General Procurement Director, who is working with Smith, setting up procurement, distribution and operating schedules. G. O. Vinger, national manager of manufacturing, is on hand with N. B. Williford, previously head of Turco's Texas factory, to supervise delivery and installation of special manufacturing equipment that will be installed. Williford has been appointed production superintendent of the Atlantic division. The production control section will be headed by John Adamzevich, of Los Angeles, known in the industry for the development of a new system of uniform chemical control of factory production. "No immediate change is in view for Turco sales representation," says Lou H. Moulton, vice president in charge of sales.

According to F. E. Warnes, sales promotion manager, this expansion is the second in a planned series of three, the first being the activation of a liquid manufacturing plant at McCook, Illinois, last year and the third being construction of a large west coast factory on a recently acquired 10-acre site in the central manufacturing district of Los Angeles. Shortly, a brochure will be released illustrating and describing the additional plant capacity now available and supplying details on how service to eastern states will be speeded.

SING A SONG OF SAVINGS!

THE WAY PORT CHESTER DOES!

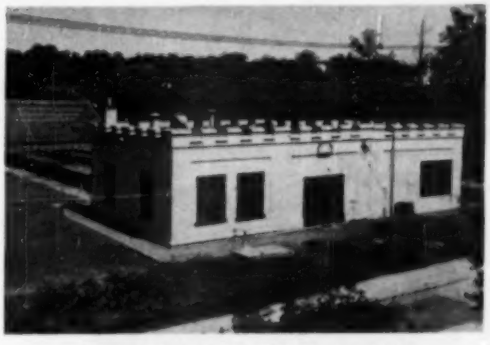


Lister-Blackstone model 27-3 30 h.p. diesel driving Port Chester's 2,000 g.p.m. sewage disposal pump.

For over fourteen years, Port Chester, N. Y.'s Lister-Blackstone model 27-3, 30 h.p. diesel served and SAVED! For 12 hours a day at peak load, driving a 2,000 g.p.m. pump in the sewage disposal plant. For standby emergencies—when flash-floods have knocked out power lines, it's a proved life-saver time and again. And after 14 years—what?

ANOTHER L/B for P/C!

So satisfied were Port Chester engineers that when re-engining was decided upon, Lister-Blackstone was FIRST CHOICE A SECOND TIME! And most significantly, *another Lister-Blackstone of exactly the same model and horsepower!*



Sewage Disposal Plant, Port Chester, N. Y.

SING A SONG OF SAVINGS with Lister-Blackstone—a sweet song of service and economy you'll enjoy down the years, whether your power needs call for 3 h.p. or 480.

—give you best engine value, longest engine life, for your dollar. Write us your requirements. Get our interesting recommendations. Address Dept. DP.

Lister-Blackstone

LISTER-BLACKSTONE, Inc.

Factory, Sales & Service Headquarters: 420 Lexington Avenue, New York 17, N. Y.
Parts Warehouses: NORFOLK, Va. 109 Second Street; BOSTON, Mass., Whosco Bldg., Fish Pier
Agents in: Boston • New York • Norfolk • New Orleans • Mobile • Tampa • Miami • Jacksonville • San Antonio • Dallas • Houston Newton (Iowa) • Seattle • Los Angeles • San Francisco • San Diego • Montreal • Toronto • Winnipeg • Vancouver
Sold and Serviced in 37 Countries Throughout the World

New Manager and Sales Manager for G.E.'s Transportation Divisions

J. H. Gauss H. W. Gouldthorpe

The appointment of H. W. Gouldthorpe as manager of General Electric's Transportation Divisions in Schenectady, N. Y., has been announced by C. H. Lang, vice president in charge of sales of the apparatus department. Immediately Gouldthorpe announced the appointment of J. H. Gauss as manager of sales of the transportation divisions. Gouldthorpe has been manager of engineering of the G-E Locomotive and Car Equipment Divisions at Erie, Pa. He graduated from the University of Michigan in 1927 with a degree in mechanical engineering and joined General Electric the same year. He was assigned to Erie in 1928 on the test engineering program. In March, 1936, Gouldthorpe became head of the mechanical design section of the transportation engineering division. He later became executive assistant to the engineer of the same division. In 1945 he spent four months touring the European battle area on an ordinance intelligence mission for the War Department. He then became Erie Works engineer, moving next to the post of manager of engineering for the locomotive and car equipment divisions.

J. H. Gauss, named manager of sales for the transportation divisions, has been associated with General Electric since 1937, when he graduated from the University of Idaho with a degree in mechanical engineering. Before his recent appointment he was assistant manager of sales for the locomotive and car equipment divisions at Erie, Pa. Gauss joined G.E. on the test engineering course. He has since served in the control engineering division, the motor engineering division, the urban transit sales division, and the railroad rolling stock sales division of the locomotive and car equipment divisions at Erie.

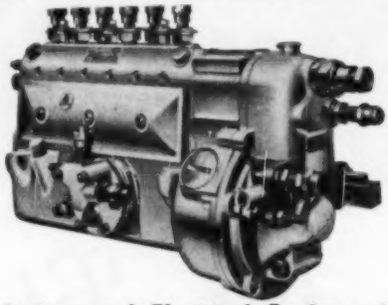
C.A.V. LIMITED SERVICE

Confidence Abroad

Transport operators all over the world have learnt to trust this sign.

In any language the letters on the C.A.V. sign stand for first-rate service facilities, maintained by highly-trained craftsmen, using special precision equipment.

Wherever vehicles fitted with C.A.V. Fuel Injection Equipment are exported — whether to Trondheim, Santiago, Hong-Kong or Sydney — there's a service agent or depot to give it the specialist attention needed for such high-precision equipment.



C.A.V. Fuel Injection and Electrical Equipment

Service Depots throughout the World

C.A.V. DIVISION OF LUCAS ELECTRICAL SERVICES INC., NEW YORK 19, N. Y.

Sales Office:
14820 DETROIT AVENUE, CLEVELAND 7, OHIO

Modern Horsecart Rides 1,700 Horses

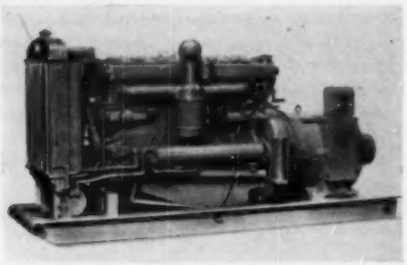
Modern horsecart rides 1,700 horses to market as this new diesel is rushed 500 miles by highway trailer to the International Latex Company in Dover, New Jersey, from the builder's plant in Grove City, Pa. The engineering feat of transporting the 117,000-pound monster diesel over the roads is the first of its kind since heavy equipment of this kind must normally be moved on railroad freight cars. The 1,700-horsepower diesel engine is built by The Cooper-Bessemer Corporation in Grove City, Pennsylvania.

Appointment of Sales Representative

Fred Winn, Jr.

Diesel Power Company, General Motors diesel distributors of Oklahoma City and Tulsa, announces the appointment of Fred Winn, Jr., as sales representative operating out of the Tulsa office. Since August, 1947, Mr. Winn has been in the employ of a large petroleum equipment supplier. He received his degree of Bachelor of Science in Mechanical Engineering at Rice Institute in June, 1945, and a degree of Master of Science in Mechanical Engineering at Oklahoma University in September, 1947. During World War II he served aboard a destroyer escort as a lieutenant, junior grade, and is now a member of the Naval Reserve holding the commission of lieutenant junior grade.

Murphy Diesel Adds Generator Set Models



The Murphy diesel line of diesel-electric generator sets was recently expanded to eleven models, ranging from 60 to 133 kw. All models comprise heavy-duty Murphy diesel engines and quality generators engineered as complete integral units and permanently aligned at the factory. Design features of the engines include "true" diesel operation, unit fuel injection, four valves per cylinder, extra heavy crankshaft with extra large bearings, oil cooled pistons and others, all of which, it is claimed, contribute to long life and economy and dependability of operation. Sudden load changes are accommodated instantaneously by a micro-control hydraulic governor which maintains desired frequency and voltage with high accuracy. Voltage is accurately controlled by a rapid acting voltage regulator.

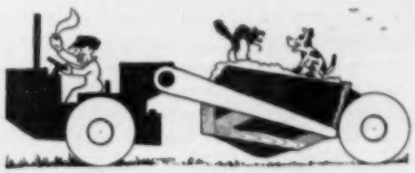
The units are suited for parallel operation of two or more sets with manual or automatic switches. Loads can be equalized or switched as required. Installation can be either portable or stationary, since engine and generator are mounted on a single skid or frame. Portable unit sare customarily radiator cooled, although the sets are supplied for either radiator or heat exchange cooling. Copies of Bulletin 106, which gives design details, specifications and dimensions can be obtained from the manufacturer, Murphy Diesel Company, 5355 W. Burnham St., Wilwaukee 14, Wisconsin.

Assistant Sales Manager Named

R. E. Bansemer

The appointment of R. E. Bansemer to the position of assistant general sales manager has been announced by the Koehring Company of Milwaukee, heavy-duty construction equipment manufacturer. At the same time, Koehring named three new district sales representatives: R. K. Patterson will be stationed in the New England sector, C. Byron Walker in the Pacific Northwest and Al. W. Schlosser in the Southeast. In his new post, Bansemer succeeds John E. Chadwick, who will join the Dalrymple Equipment Company organization, Koehring product distributor in the state of Mississippi. Bansemer started his career in the production department at the Koehring plant in 1923. He spent some years in the service department as equipment demonstrator and later moved into the sales department as district sales representative.

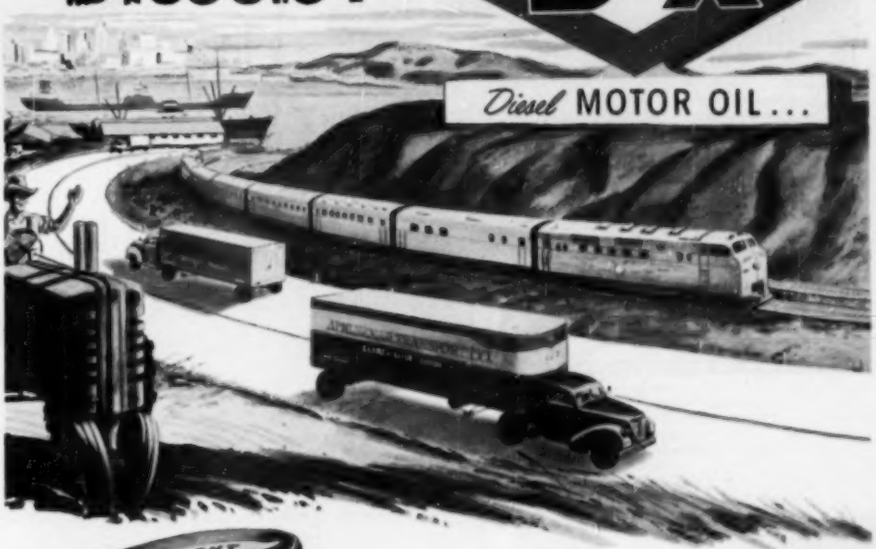
R. K. Patterson, new district representative appointed by Koehring, has been in the equipment business on the Eastern seaboard for many years, both in sales and service capacities. He served as equipment engineer for Navy Bureau of Yards and Docks during World War II and, most recently, has been associated with the Capitol Equipment Company, Koehring distributor for Central Pennsylvania. C. Byron Walker joins the Koehring organization as district representative after being associated with the Pacific Car and Foundry Co. for 14 years. During that time he has done machine design work, was advertising manager, service manager and assistant sales manager in the tractor equipment division. Al. W. Schlosser will be working out of Atlanta, Georgia, as the new Koehring district representative for the Southeastern states. Schlosser has been in the construction business for the past 15 years. After obtaining his degree in architectural engineering from Alabama Polytechnic Institute, he became associated with a construction contractor in Georgia. Later he established and operated his own equipment business in Decatur, Georgia.



Higher Heat Resistance for Diesels!

D-X

Diesel MOTOR OIL...



D-X has proved itself in all kinds of Diesels—on trains, trucks, tractors, stationary installations, portable power plants and boats. It's the Diesel Motor Oil that *stands up* on long runs at high temperatures and under high pressures.

D-X Diesel Motor Oil is made to resist foaming and sludge formation. It's non-corrosive—*safe!* It will give you the greatest efficiency from your Diesel at a surprisingly low cost. Try D-X Diesel Motor Oil in your Diesels.

D-X

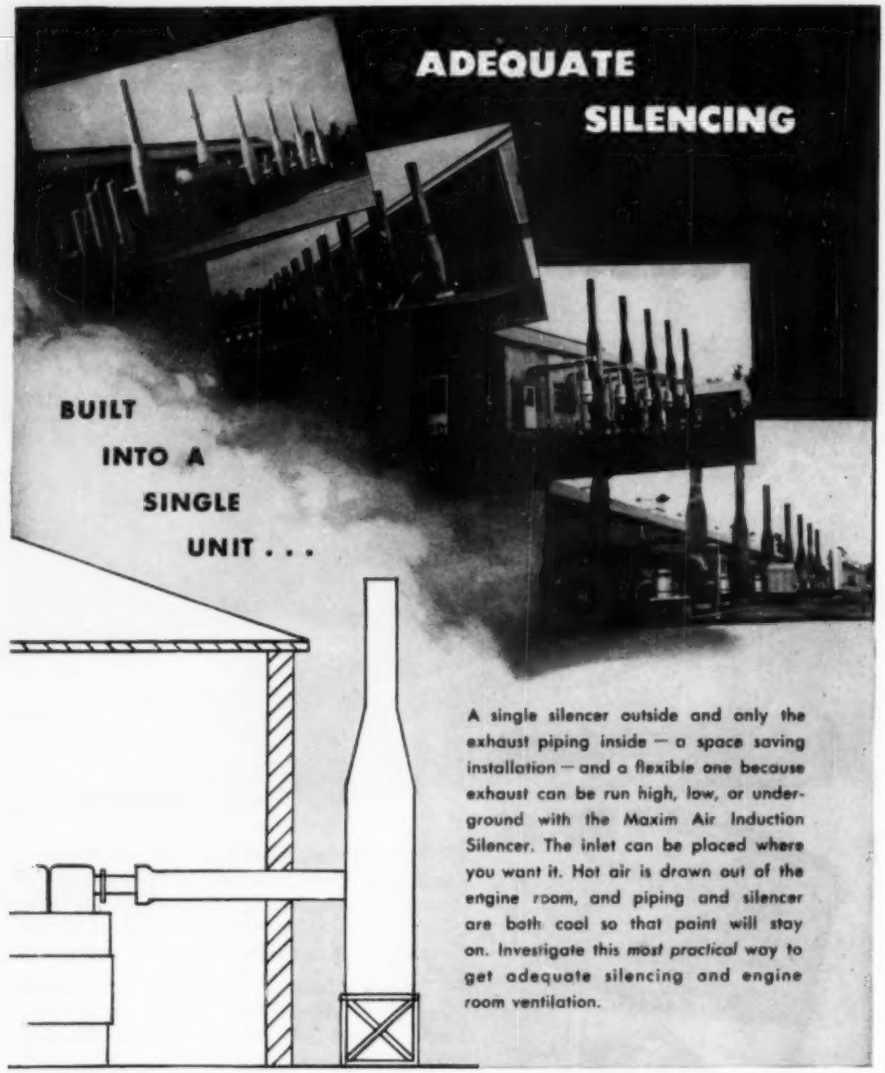
MID-CONTINENT PETROLEUM CORPORATION
TULSA, OKLA.
Waterloo, Ia. Terre Haute, Ind. Omaha, Nebr.
Chicago, Ill. Minneapolis, Minn.

Eutectic Appoints National Sales Manager

Appointment of Mr. F. F. Roehll as national sales manager, Eutectic Welding Alloys Corporation, was announced recently by Mr. Rene D. Wasserman, president. The company manufactures a complete line of welding rods, electrodes, and fluxes. A graduate of Ohio State University, Mr. Roehll has devoted his entire career to sales and sales management, with particular emphasis on the industrial field. His business associations in the field of welding extend from coast to coast. He entered the service of Eutectic shortly after the war as a local district engineer in California. After several years of service in the West, Mr. Roehll was transferred to the New York office, where he served as sales supervisor. Mr. Roehll now assumes full charge of Eutectic's 200-man national field force, which extends throughout the United States.

A.S.M.E. Names Vice President

Dr. John T. Rettaliata, 38, of 9712 South Winchester Avenue, dean of engineering at Illinois Institute of Technology, has been named vice president of the American Society of Mechanical Engineers. Dr. Rettaliata, a leading authority on turbine engines and jet propulsion, is the author of numerous technical articles. He joined the Illinois Tech staff in 1945 as professor of mechanical engineering and director of the department. He was named dean in 1948. A native of Baltimore, Maryland, Rettaliata received his bachelor's degree in mechanical engineering in 1932 at Johns Hopkins University and his doctor's degree there in 1936. From 1936 to 1945 he was employed by Allis-Chalmers in Milwaukee. Since 1945 he has remained on the Allis-Chalmers staff as consultant. He is a member of the Western Society of Engineers, the American Association for the Advancement of Science, American Society of Naval Engineers and eleven other professional societies.



A single silencer outside and only the exhaust piping inside — a space saving installation — and a flexible one because exhaust can be run high, low, or underground with the Maxim Air Induction Silencer. The inlet can be placed where you want it. Hot air is drawn out of the engine room, and piping and silencer are both cool so that paint will stay on. Investigate this *most practical* way to get adequate silencing and engine room ventilation.

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New Handy Gas Torch

The new Otto Bernz LP Gas Torch is a completely portable, instant lighting, "cylinder refill" hand torch that burns in both cold or warm temperatures. This highly efficient torch is equipped with interchangeable burners expertly designed to suit special needs. The pencil flame burner produces a fine, intensely hot flame that is adjustable from pinpoint size up to a 2-inch length inner cone. The utility burner gives an intensely hot brush type flame adjustable from 2 to 4 inches. The calculated flame temperature for both burners is 3660°F. When the cylinder of fuel is empty, it takes only a few seconds to unscrew the burner from the cylinder and exchange it for a completely filled one. The cylinders (ICC-4B240 approved) are available at leading dealers and jobbers for only $1.00.

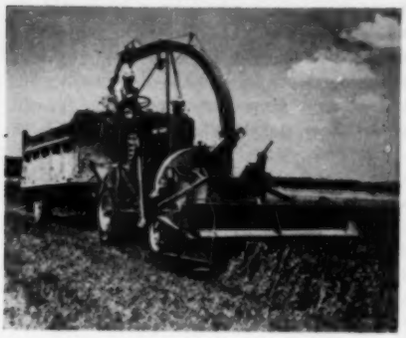
● Burner quickly and easily detached for "cartridge refill."

The instant lighting torch requires no pumping or pre-heating and gives a clean, hot, economical flame. Fully loaded the cylinder weighs less than 2½ pounds. This torch is completely portable—it fits your hip pocket or tool kit. There is no heavy tank, tangling hose or gauges to impede operation. The Bernz LP Gas Torch burns in any position, including upside down. The torch is designed to operate with propane fuel. One "cylinder refill" of fuel will operate the torch for 12 hours or more, depending on the size of flame used. For further information write DIESEL PROGRESS, File 52, P. O. Box 8458, Los Angeles 46, Calif.

September Fifth

That is the day the first copies of the DIESEL ENGINE CATALOG, VOLUME FIFTEEN, will go into the mails. Completely revised from volume fourteen. A big book in every way, 374 pages, 10½ inches by 13½ inches. Every diesel engine, every dual-fuel engine, every natural gas engine actively manufactured and marketed in these United States is technically and completely described and illustrated in this new edition—ready to mail September 5th. Price $10.00—send order to DIESEL PROGRESS, P. O. Box 8458, Cole Station, Los Angeles 46, California.

Time, Labor and Operating Expenses Saved by New Alfalfa Harvester



Substantial savings in time, labor and operating expense are being effected by the Greenmelk Company, Ltd., alfalfa dehydrators, of Wallaceburg Ontario, with three new harvesters designed and built by Bert-Wetta-Van Horn, of Maize, Kansas.

This new type harvester, known as the "Field Queen," is unique because in addition to cutting and loading the alfalfa on a trailer, it also chops the crop, making it ready for the dehydrator without further processing. The "Field Queens" each eliminate the need for one piece of equipment and the labor of three men for the Greenmelk Company. They also help expedite the alfalfa from field to dehydrator. This is important in preserving the carotene content of the dehydrated product used as an ingredient in prepared feeds for livestock and poultry.

Designed for 'round-the-clock operation, each unit is powered for propulsion, hauling, cutting and chopping by a 3-cylinder General Motors 2-cycle diesel engine developing 65 continuous h.p. at 1,600 rpm. According to Eugene Korber, plant superintendent, the fact that these units burn a lesser quantity of lower priced fuel and reduce equipment and labor by over 50 per cent, a sharp reduction in the season's harvesting costs is anticipated.

Even over the roughest terrain the "Field Queen" maintains a steady speed of from 2 to 7 miles per hour (depending upon the growth of the hay), cuts clean and assures a steady flow to the plant. The machine has four speeds forward and one reverse. All four forward speeds are varied by the use of a variable speed drive.

Cutting a 7-foot swath, the unit moves across the field pulling a trailer to receive the crop. A reel on the front of the machine presses the alfalfa against a standard type sickle. The cut alfalfa is carried upward to the chopping blades by two steel conveyors. At this point a heavy bladed centrifugal fan revolving at over 700 rpm. blows the chopped alfalfa through an overhead tube to the trailer. The Greenmelk Company's alfalfa was being harvested by the "Field Queen" at the rate of three 5-ton loads per hour. Flood lights on the equipment permit night-time operation. While the "Field Queen" is a relatively new invention, units are currently in operation or on order for use in Kansas, Oklahoma, Nebraska, Colorado, Illinois, Missouri, Louisiana, Texas and Canada.

DIESEL ENGINE CATALOG

VOLUME FIFTEEN

ENTIRELY REVISED AND RE-WRITTEN

Volume Fifteen will be ready to mail on September Fifth. Send your order in NOW and your copy will start on its way to you right after Labor Day.

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Baldwin Locomotive Works
Buda
Burmeister & Wain
Caterpillar
Chicago Pneumatic
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Cleveland Diesel
Consolidated Diesel Electric
Continental
Cooper-Bessemer
Crofton
Cummins
Detroit Diesel
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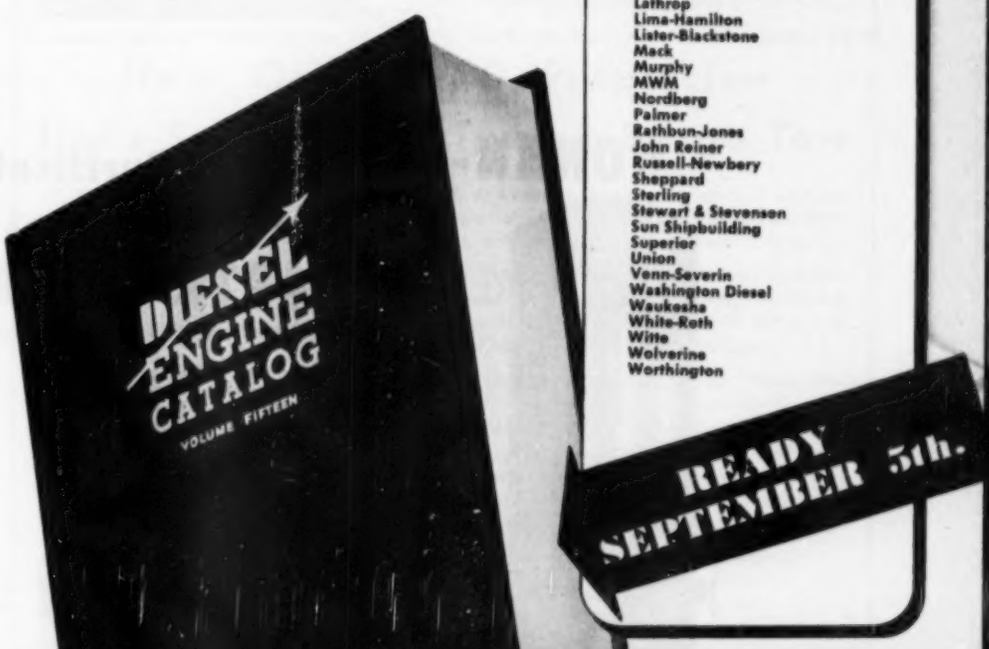

DIESEL ENGINE CATALOG P. O. Box 8458, Cole Station, Los Angeles 46, Calif.

Enter my order today for a copy of the 1950 Diesel Engine Catalog, Volume Fifteen, Edited by Rex W. Wadman, for which I enclose $10.00, also payable at £4-0-0 to E. H. Doddrell, 342 St. Paul's Corner, Ludgate Hill, London E.C.4.

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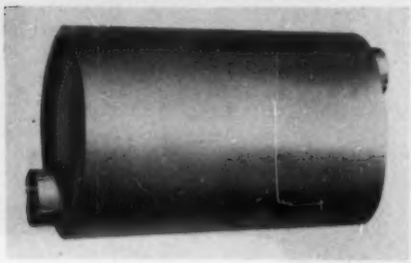
New Line of Heavy-Duty Mufflers



A new line of heavy-duty mufflers, said to reduce exhaust noise to a low level without objectionable back pressure, has been introduced by the Donaldson Company, Inc. The new mufflers are fully-engineered to satisfy the demands of the public for noise abatement and reduce driver fatigue through improved silencing. The back pressure of Donaldson mufflers falls well within the "acceptable range" permitted by engine manufacturers. It is claimed that the new mufflers reduce smoke and fumes, lessen valve pounding, improve volumetric efficiency of the engines, decrease fuel consumption, lower muffler jacket temperatures and reduce cab panel drumming and vibration.

The mufflers are made of aluminized sheet throughout to inhibit corrosion and assure longer muffler life. Two types are available—a vertical cab-mount muffler and an oval type for under-chassis installations. Both are designed for gasoline and diesel engines in the 150 to 300 hp. range.

Truck manufacturers and fleet owners are offered results of muffler tests made by the Southern California Motor Truck Association. These tests were made before a jury panel and experts, which rated Donaldson muffler performance together with that of other makes. A folder giving specifications of Donaldson mufflers is also available and may be had by writing DIESEL PROGRESS, File 44, P. O. Box 8458, Los Angeles 46, California.

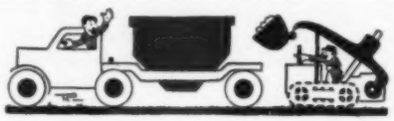
Marks 25 Years at Purolator

Howard J. Hopkins

Howard J. Hopkins, jobber division sales manager of Purolator Products, Inc., Rahway, N. J., and for many years a widely-known figure in the automotive parts industry, marked his 25th anniversary with Purolator May 15. Ralph R. Layte, president of the company, presented Mr. Hopkins with his quarter-century service pin at an informal ceremony in the company's new plant at Rahway, to mark the occasion. Mr. Hopkins, born in Arlington, N. J., in 1905, attended local schools and the Newark (N. J.) College of Engineering before joining Purolator as a draftsman. The enterprise, then less than two years old, was struggling to found the automotive filter industry. Since that time, first as a sales correspondent, then successively as district manager in Wichita, Kansas, Boston and New York City, Mr. Hopkins has seen Purolator, and the industry in which it pioneered, grow to major importance in the automotive field. There are now nearly 90 companies engaged in the manufacture of automotive oil filters. Mr. Hopkins was appointed eastern zone manager of Purolator in 1940, and early the following year was sent to Washington as Purolator representative contacting the Government agencies serving the Armed Forces. Early in 1945, he became assistant sales manager, and was named to his present position in 1947.

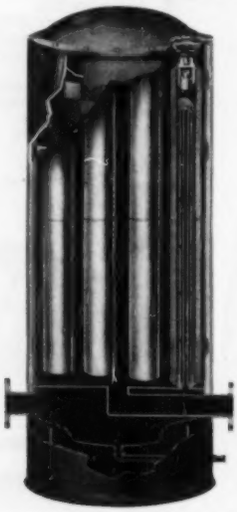
New Diesel-Driven Bus

In keeping with the current trend toward diesel driven buses, the Fitzjohn Coach Company, of Muskegon, Michigan, is offering their new rear-powered Cityliner model with Hercules diesel engine. This engine, of 4-cycle, 6-cylinder type, is of 426 cu. in. displacement, developing 142 horsepower at 2,600 rpm., and 330 foot-pounds of torque at 1,500 to 1,900 rpm. The Cityliner is a 33-passenger coach with rear exit door, and will seat 35 passengers without the rear door. It is planned to announce soon similar coach of larger capacity seating 35 passengers. During the past few weeks five Fitzjohn Cityliners (for city service), equipped with diesel engines, were delivered to the Citizens Transit Company of Oil City, Pennsylvania.



HONAN-CRANE Oil Purification offers 3 types of interchangeable CARTRIDGE REFILLS

for correct handling of every purification problem

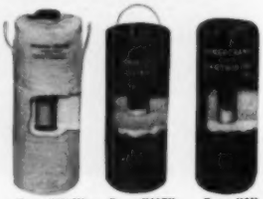


Three types of cartridge refills, designed by Honan-Crane especially for Honan-Crane purifiers, make it possible for you to select the filtering medium best suited to your purification needs. Cartridges are interchangeable and may be used to remove either solids or products of oxidation . . . maintaining any oil in approximately new condition.

Easy-to-handle Honan-Crane refill cartridges are your assurance of thorough oil purification at lowest cost.

Honan-Crane Type "M" Continuous Oil Purifier

Multiple-cartridge purifier, available in eleven sizes using 1 to 24 cartridges. Provides high flow rate and is designed to use easy-to-change "MC", "MF", or "S" type cartridges.



Type "MC" Type "MF" Type "S"

Honan-Crane Type "MC" Cartridge

"MC" Cartridge is a woven cotton bag containing 13 pounds of Cranite (specially processed fullers earth). Solids and abrasives as well as soluble products of oxidation such as asphaltenes, resins and acids are removed from the oil.

Honan-Crane Type "MF" Cartridge

"MF" Cartridge is a perforated metal basket lined with a woven cotton sock material and uniformly packed with Palconia (specially selected cellulose fiber filtering medium). Complete removal of solids such as abrasives, scale and other foreign matter.

Honan-Crane Type "S" Cartridge

Type "S" Cartridge contains 4½ pounds of Palconia tightly packed in a specially woven cotton sock material. Performance of the cartridge is comparable to the "MF" cartridge in removal of abrasives, scale and other foreign solids.

Write for descriptive bulletins covering Honan-Crane Oil Purification Equipment for Diesel Lube and Fuel Oils, Turbine Oils, Cutting Oils, Quench Oils, Coolants, etc. State type of purification problem.

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Speed Trial at Bonneville Flats

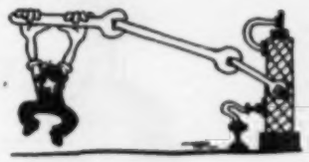
The green Cummins Diesel Special, No. 61, which set new diesel speed marks in the 1950 Indianapolis Speedway qualifications and race, will try for six international speed records for diesel-powered cars, officials of Cummins Engine Company, Inc., Columbus, Ind., announced recently. The straightaway runs on the Bonneville Salt Flats, 100 miles west of Salt Lake City, are scheduled in the immediate future. Jimmy Jackson, veteran driver in the Indianapolis 500-mile race from Desert Hot Springs, Calif., who drove the diesel in the Speedway competition last Memorial Day, will pilot the car in the Salt Flats record run. D. J. "Don" Cummins, vice president-engineering for Cummins, said "no change has been made in the car other than to add a hood over the driver's seat, thereby completing the streamlining. The engine is the same. The run will take up from where we left off at Indianapolis. The race car engine is a revised, highly-supercharged version of the standard JS model manufactured by Cummins. The diesel power plant is made of aluminum and magnesium, and develops 340-plus horsepower at 4,000 rpm. It weighs 2.06 pounds per horsepower, which makes it one of the lightest and highest speed diesels ever used in public competition. The engine uses only standard commercial diesel fuel, the same kind that is burned in home furnaces.

The Bonneville run aims at two existing international speed records for diesel-powered cars and intends to establish four more. The international diesel speed records for one mile at 158.87 mph and one kilometer at 159.10 mph. are held by a British car driven by George Eyston, of England. "Wild Bill" Cummings, driving the Cummins race car No. 5, which competed at Indianapolis in 1934, set a world's record at Daytona Beach, Fla., for five miles at 112.07 mph. and five kilometers at 126.990 mph. Although the marks for five miles and five kilometers are not recognized as international speed records for diesel-powered cars, Jackson in the Bonneville run expects to surpass these speeds while attempting to establish new international records for these distances. His official 129.208 mph. qualifying mark for 10 miles around the Speedway oval in the 1950 Cummins Diesel Special is an indication of the added speed that will be unleashed in the straightaway race against time on the Salt Flats. The straightaway course at Bonneville is expected to be 14½ miles long. Two trips down the course, one in each direction, with the second required in 30 minutes after the first, must be made. An average of the time for each distance on both runs determines the speeds made on the course. All of the six distances are laid out over the 14½-mile course, and official AAA timing equipment measures the speed the car makes each distance. A fast enough run up and down the course could break the existing records and establish new ones for 10 miles and 10 kilometers.

The race car chassis was built by Kurtis-Kraft, of Los Angeles, using a welded, tubular steel construction and an all-aluminum streamlined body. A Conze quick-change racing axle is used, and Goodyear aircraft disc brakes are on all four wheels. No. 61 is the fourth Cummins race car. The first, in 1931, driven by Dave Evans, finished the entire 500 miles at Indianapolis without a pit stop, the first time such a feat had been accomplished in Speedway history. The other two cars were entered in 1934; one driven again by Dave Evans was forced out early in the race, and the other, driven by "Stubby" Stubblefield – which later went to Daytona–finished twelfth.

Catalog—Volume Fifteen

On September 5th the first copies of the new volume fifteen of the DIESEL ENGINE CATALOG will go into the mails. A complete revision of volume fourteen, with many new engines, many new models, many old models re-rated. In this volume fifteen you will find every diesel engine, every dual-fuel engine and every natural gas engine actively manufactured and sold in these United States, technically and completely described and illustrated. Plus a large and very important accessory equipment section. Truly described as the Bible of the Industry, this volume fifteen of the DIESEL ENGINE CATALOG can be obtained by mailing $10.00 to DIESEL PROGRESS, P. O. Box 8458, Cole Station, Los Angeles 46, California.



Sohio Petroleum Company's "Sohio Fleetwing" and 12 barge tow, with 2 Harbormaster Outboard Propulsion and Steering Units

How OUTBOARD Propulsion Units Speeded Up Twelve Barge Tow

"... increase in speed of tow ..."

"... considerable increase to the steering power ..."

"... definite help in locking ..."

THE Sohio Petroleum Company, with headquarters in St. Louis, successfully used two Harbormaster Outboard Propulsion and Steering Units on the "Sohio Fleetwing," shown above with 12 barge tow.

A study made by Sohio to determine increased efficiency shows that Harbormaster increased the speed of the Fleetwing tow by 0.90 m.p.h.! The Fleetwing developed approximately 2400 SHP and her twelve barge tow carried about 17,000 tons at 8'6" draft.

The company cites other specific advantages, stating: "We have had two reports from pilots stating that the units were valuable in the lower Mississippi in making bad crossings in that their use gives a considerable *increase to the steering power of the boat.*" Sohio also found that "*the units are a definite help in locking in the Ohio River,* especially after the head line is on the lock wall and the full steering power of the main engines cannot be used."

Sohio is just one of the many Harbormaster owners who have saved money and got increased efficiency through the natural advantages of outboard propulsion. Our catalog containing over 70 photos and diagrams gives further valuable information. Gladly sent you on request whether you have immediate or future use for Harbormaster units. Why not write for the catalog *now* so that you will have full information on file?

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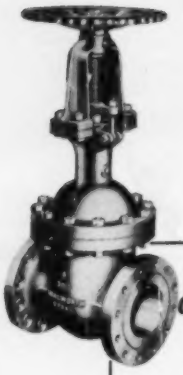

Sectional view of Series 300

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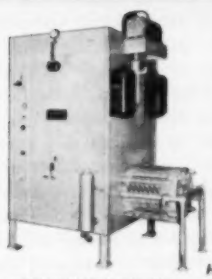

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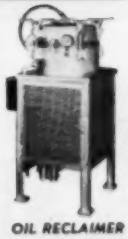

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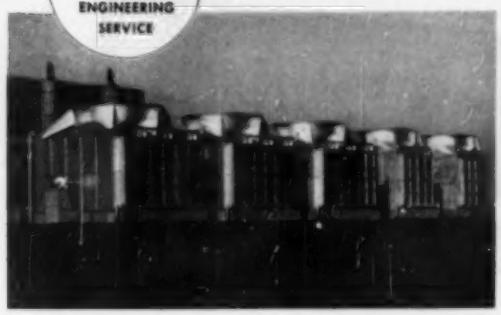

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National Supply Buys Atlas

The National Supply Company, Pittsburgh, Pa., took steps last month to broaden their existing sales and service facilities as well as their horsepower range of diesel engines when they purchased assets of the engine division of the Atlas Imperial Diesel Engine Company, Oakland, California. The purchase included the name, patents, trademarks, designs, together with certain machinery and equipment, as well as sales and service outlets and inventories throughout the United States and Canada from Halifax, Nova Scotia, south to Houston, Texas, on the East and Gulf coasts, and from Ketchikan, Alaska, south to San Diego, California, on the West coast. The manufacture of Atlas Imperial diesel engines and parts will be carried on at the Springfield plant, according to F. H. Kilberry, head of National Supply's Engine division. "The Atlas Imperial administrative and manufacturing operations are rapidly being moved to Springfield, Ohio, in line with our policy of integrated expansion," he said. "We intend to give all domestic, as well as foreign owners and new purchasers of Atlas Imperial engines, complete sales and service. The present service facilities will be maintained with seasoned and efficient personnel. A complete stock of parts will be made available in line with National's long established policy of giving the best possible service."

Atlas Imperial has long been known from Alaska to Mexico as a leader in the West Coast diesel engine industry, particularly in the marine field, where its engines have been used extensively for years by such well known firms as Alaska Packers Association, British Columbia Packers, Nootka Packing, Shaver Transportation, Libby McNeil Libby, Inc., and many others. Although younger than Superior by 17 years, Atlas ranks as one of the leading American diesel engine manufacturers. The company contributed, in a large part, to the growth and steady expansion of the Pacific Coast fishing fleets. Established as two separate companies, Atlas, managed by A. Warrenskjold and Jack Lorimer, and Imperial, headed by M. E. Wright and Ed Moffett, the companies were combined in 1917 at Oakland, California, as the Atlas Imperial Diesel Engine Company. From the leader of the industry on the West Coast, Atlas Imperial grew to an organization which has served the world. Like Superior, Atlas Imperial claims an impressive record of industry pioneering. The first diesel to be installed in a power excavator was an Atlas in a Bucyrus shovel and over a period of years, many hundreds of Atlas diesels were used by the various excavator manufacturers. The first diesel installed in a caterpillar tractor was an Atlas and a number of tractors of this type were successfully used on the Hawaiian sugar plantations. The first diesel industrial locomotive was built by Plymouth and powered by Atlas. The purchase of Atlas Imperial adds to the world wide character of National Supply's Engine Division. Atlas Imperials, like Superior engines, are being operated in practically every country in the world and in almost every conceivable type of service.

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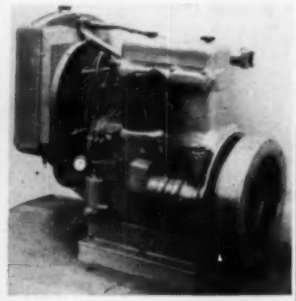
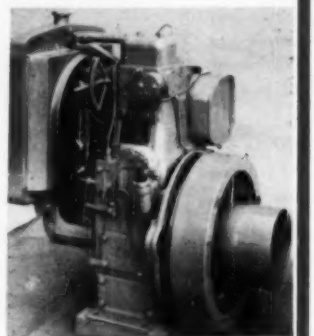


Model KDW415D, 3 Cylinders, 36 H.P., 1500 R.P.M. Weight: 1250 lbs.

Model KDW415Z, 2 Cylinders, 24 H.P., 1500 R.P.M. Weight: 1000 lbs.



Model KDW415E, 1 Cylinder, 12 H.P., 1500 R.P.M. Weight: 750 lbs.

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New Air Intake Snubber and Exhaust Snubber Improvements

A new type air intake snubber for industrial noise abatement and improvements in exhaust snubbers, were announced recently by the Burgess-Manning Company. The new type, known as SOA Series air intake snubber, is a compact, economical unit for installations where noise rather than air surge is the major problem in internal combustion engines, compressors and blowers. It is suitable for applications to all but the most critical intakes of rotary type blowers and compressors. The SOA Series, weighing from 110 to 3,700 pounds, snubs or checks incoming pulsations of air, so that the oscillating air flow that causes pumping noise is smoothed into a more unidirectional flow, and noise is reduced.

The SOA Series, designed for most industrial and non-critical locations, is for use on blower scavenged or naturally aspirated internal combustion engines, positive displacement rotary blowers and for mounting on top of filter houses used with pump scavenged internal combustion engines. The new series replaces the SDA Series, which were designed to do the same job, but were larger and heavier, and therefore somewhat limited in application. Net weight of SDA 30, for instance, was 5,100 pounds, compared with 3,700 pounds for the SOA 30. The company also reported improvement in its various type light and heavy duty exhaust snubbers to increase the range of application. New bulletins describing the changes are now available upon application.

Natural Gas Plant Proves Economical

Fuel at practically no cost gives an extremely low unit generating cost for electricity at the central electric power generating station of Kern-Trinidad Oilfields, Ltd., Trinidad, British West Indies. The electric generators are driven by gas engines which are fueled with natural gas from the pumping oil wells which the plant serves in the southwestern part of Trinidad, where most of the island's oil production is located. This gas would ordinarily be a waste product. The plant was planned for durability and economy. It had to be simple to operate yet had to be capable of giving satisfactory voltage and frequency regulation under complex and variable conditions. This plant furnishes power for oil well pumping, water well pumping, machine shop operation, and domestic and power plant lighting.

The oil wells served, about 100, offer the most serious complications. While not unusually deep, some of them turn to gas and unbalance the entire power system. The well load at the generating station may at times fluctuate rhythmically when the peaks of the pumping cycle coincide on a number of wells. The station is equipped with three Superior 6G-510 six-cylinder gas engines. Each engine is direct-connected to a 720-rpm., 150-kw., 480-volt, 3-phase 60-cycle single bearing generator. The generator exciters are top-mounted and V-belt driven. Engines and generators were supplied by National Supply Export Corporation, New York, through Neal and Massey Engineering Co., Ltd., of Port of Spain, Trinidad.

Even under rather difficult operating conditions, good regulation is insured whether the units are operating singly or in parallel. An extra large diameter wrought-steel flywheel is used, and a Woodward hydraulic relay-type governor was installed on each engine. Fuel gas pressure is accurately regulated at the engine, and a voltage regulator controls the excitation of each generator. The increase in flywheel effect is obtained by the large diameter and correspondingly high rim velocity, rather than by excessive weight. High bearing loads are thus avoided. Current, generated at 480 volts, is stepped up to 3,300 volts at the station and transformed down to the required voltage at the various points of utilization. All lighting is at 110 volts.

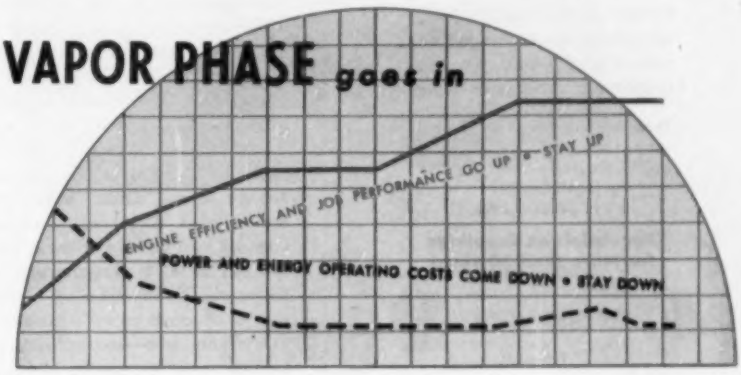
Each engine has a built-in jacket water circulating pump and an individual jacket water heat-exchanger. Thus, each of the three engines has its individual closed jacket water system equipped with surge tank. A V-belt driven, raw water pump at each engine circulates cool water from the cooling tower sump through the engine's jacket water heat-exchanger and back to the top of the large atmospheric cooling tower. This tower serves all engines. There is a shell-and-tube type lubricating oil cooler, through which the jacket water circulates before entering the engine jackets, for each engine. When the engine first starts ,the jacket water can warm the oil; when the engine has warmed up under load, the jacket water circulation cools the oil.

Each engine is equipped with large capacity, by-pass-type lubricating oil filters. The exhaust silencer is at the outer end of the horizontal exhaust pipe, which has flexible steel pipe connections to the engine manifolds. Because this plant operates in a tropical climate, the upper part of the building's walls are of wire mesh to afford ample air circulation. Oil bath type intake air filters are therefore mounted directly on the engines.

September Fifth

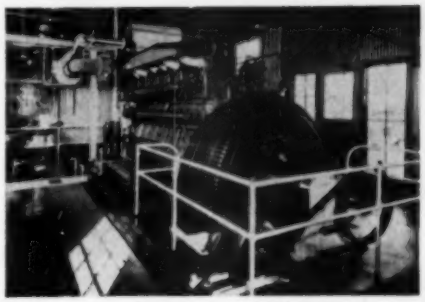
That is the day the first copies of the DIESEL ENGINE CATALOG, VOLUME FIFTEEN, will go into the mails. Completely revised from volume fourteen. A big book in every way, 374 pages, 10½ inches by 13½ inches. Every diesel engine, every dual-fuel engine, every natural gas engine actively manufactured and marketed in these United States is technically and completely described and illustrated in this new edition—ready to mail September 5th. Price $10.00—send order to DIESEL PROGRESS, P. O. Box 8458, Cole Station, Los Angeles 46, California.

When VAPOR PHASE goes in



BONNEVILLE POTASH PLANT *Solves Power & Heat Problems with*

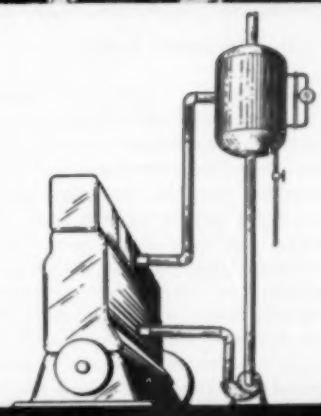
ULTRA MODERN VAPOR PHASE AND A STANDARD WORTHINGTON DIESEL



In 1948, this remote plant on the Great Salt Flats in Utah faced serious problems. Tough, costly operating conditions and dwindling market prices demanded action, extreme production economy. But how?

The answer came in September, 1949, when a Vapor Phase equipped 450 rpm. Worthington Diesel engine was installed.

Besides converting the engine into a super-efficient power and lighting unit, Vapor Phase permitted the use of a cheap, heavy, high sulphur content engine fuel oil, cutting the normal fuel bill in half. It supplied steam for heating the fuel oil, water space, etc. It solved the fresh water problem in this isolated desert country. *Here was economy plus!*



Now, thanks to Vapor Phase, this standard Diesel averages 14.25 kw/hrs per gallon on cheap heavy fuel. Lube oil averages 3 gal. per 24 hrs., or 4,320 sea-level-rated HP/hrs. per gallon. Lube oil now changed every 3,000 hrs. instead of 500 hrs. And the plant produces annually over 70,000 tons of commercial potash *efficiently, profitably!*

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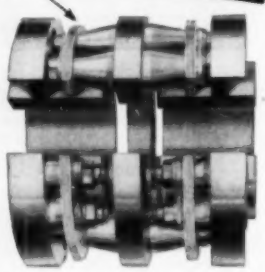

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Large Order Received by Davenport Besler Corp.

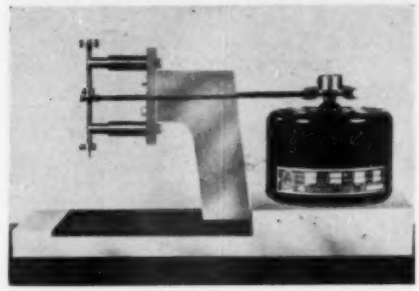
More than a year ago, a group of railroad officials from far off Thailand visited the Davenport Locomotive Works on an inspection tour. Negotiations carried on since that time have borne fruit in the form of a four and a half million dollar order for forty-five Davenport diesel-electric locomotives for the Royal State Railway of Thailand. Of the forty-five power units destined for the land of the sacred white elephants, fifteen are to be 78-tons, 0-6-6-0, each equipped with two 500-hp. Caterpillar engines; and thirty are to be 53-tons, 0-4-4-0, equipped with one 500-hp. Caterpillar engine.

Intended for main line railroad service, both passenger and freight, the locomotives being built by Davenport will operate on rail lines radiating out from Bangkok, the capital, to distances of over nine hundred kilometers. The electrical equipment is Westinghouse; forced ventilated motors (also Westinghouse) are employed. The trucks are General steel castings, one-piece cast steel. All wheels are mounted on roller bearings. Straight air and vacuum brakes by Westinghouse are employed. Nickel-cadmium batteries (the first large lot used in locomotives in this country) are specified for this entire group of locomotives. The locomotives on this order are of meter gauge and capable of speeds up to 70 kilometers or approximately forty-three and a half miles per hour. The smaller, 53-ton, locomotives have a driver's cab at one end and are equipped so that they may be coupled together to become virtually a single power unit of 100-ton and 1,000-hp.—capable of performing the maximum tasks called for and when operating in single 53-ton units are suited to somewhat lighter haulage but without a waste of power. The engineering of these units required consideration of climatic conditions as they affect both the diesel engines and the electrical equipment. Temperatures in Thailand range from 35° to 110° Fahrenheit and relative humidity seldom departs from a range of 74 to 100. Deliveries on these Thailand bound locomotives will begin in January, 1951, and will be completed by August of the same year.

New Water Treatment Folder

Prevention of lime scale deposition by "threshold treatment" of the water with Calgon is described in a new folder offered by the manufacturer, Calgon, Inc., Pittsburgh, Pennsylvania. Calgon, a vitreous sodium phosphate, is dissolved and the solution is added continuously to the water, effective concentrations ranging from about 1 to 10 parts Calgon per million of water. Slightly higher concentrations have proved effective, it is added, in eliminating deposition of other scale-forming salts such as calcium sulfate, calcium sulfite, and various salts of barium, as well as calcium carbonate. Typical applications of threshold treatment are cited, including prevention of lime scale deposition in boiler feed water lines, caustic and hypochlorite bleaching in paper mills, water heating, recirculating cooling systems, multiple-effect evaporators, and after-precipitation following lime-soda softening.

New Micro Drilling Machine



The new Walcon Micro Drilling Machine is the result of long experimenting to produce a practical and precision machine of extreme simplicity, yet capable of high production of holes as small as .0016 diameter with a minimum of drill point breakage. It is a new design in drilling machines in that it has only one moving part. The only moving part in the new Walcon Micro Drilling Machine is the spindle. The spindle runs in bronze oilless bearings of the Vee type and is held in place and in perfect alignment without the need of adjustments by the endless rubber drive belt. Thus whatever wear which might develop between the spindle and the bearings is automatically taken up by the pull of the belt. One of the main reasons for "micro drill" point breakage is the tendency of the drill to "hog" into the work, especially when breaking through the hole; this cannot happen with the new Walcon Micro Drill, for here again the drive belt plays a very important part. On account of the angle of drive of the belt there is a constant "pulling up" force exerted on the spindle which never allows the drill point to be pulled into the work with the consequent breakage of drill points. For further information write DIESEL PROGRESS, File 45, P. O. Box 8458, Los Angeles 46, Calif.

Honored for 25 Years Service

Paul R. Sidler

Paul R. Sidler, president of Brown Boveri Corporation of New York, completing 25 years of service with the parent organization—Brown, Boveri & Co., Ltd., of Baden, Switzerland, was recently honored at the home office on the occasion of his service anniversary. In keeping with the Brown Boveri tradition Mr. Sidler was tendered a banquet in his honor, at which time he was given a gold watch, certificate of service and other sentimental tokens. Paul R. Sidler's association with Brown Boveri & Co., Ltd., dates back to 1925, when he graduated from the Institute of Technology as an electrical engineer. In June, 1931, he came to New York as the resident engineer for the firm. Now an American citizen, he became president of Brown Boveri Corp. in 1946. Mr. Sidler is a member of the A.S.M.E., A.I.E.E., N. Y. Electrical Society, Engineers Club, Downtown Athletic Club and Swiss Assocaition of Electrical Engineers.

Fuel Spray Studies

To determine the uniformity with which a nozzle distributes fuel within its spray pattern, engineers at the Beacon, N. Y., laboratories of The Texas Company developed this spray sampler. A fan of metal tubes is placed across a diameter of the spray, and the fuel striking the end of each tube is collected in a graduated vial and measured. A slight vacuum is maintained in the vials to facilitate the flow of fuel through the lines. The unit is used for both intermittent and steady-flow nozzles. Jet engines, diesel engines, and oil burning furnaces all use nozzles to spray the fuel into the combustion chamber. The fuel spray characteristics of these nozzles are of vital importance, since they affect the efficiency with which the fuel is burned and hence the heat or power output and the economy.

Appointment of New Diesel Engine Department Manager

Robert S. Oberlander

R. B. Crean, vice president in charge of apparatus sales, The Baldwin Locomotive Works, Eddystone, Pa., has announced the appointment of Robert S. Oberlander as manager, diesel engine department, with responsibility for the sales of the entire Baldwin-De La Vergne line of stationary diesel engines and diesel-electric generating units. Mr. Oberlander was born in Philadelphia and received his education in the Philadelphia public schools, Strayers Business College, and Pennsylvania State College Extension School. Upon completion of his schooling he entered the employ of Sharp & Dohme, where he served in the machine shop for a period of four years. In 1941, Mr. Oberlander joined the Baldwin organization, where he added to his mechanical background by spending 2½ years in the machine shops. In 1943, he was transferred to the diesel engine sales department, at the main office in Eddystone, and in 1947 he was named acting sales manager of this group, which position he held at the time of his recent appointment.

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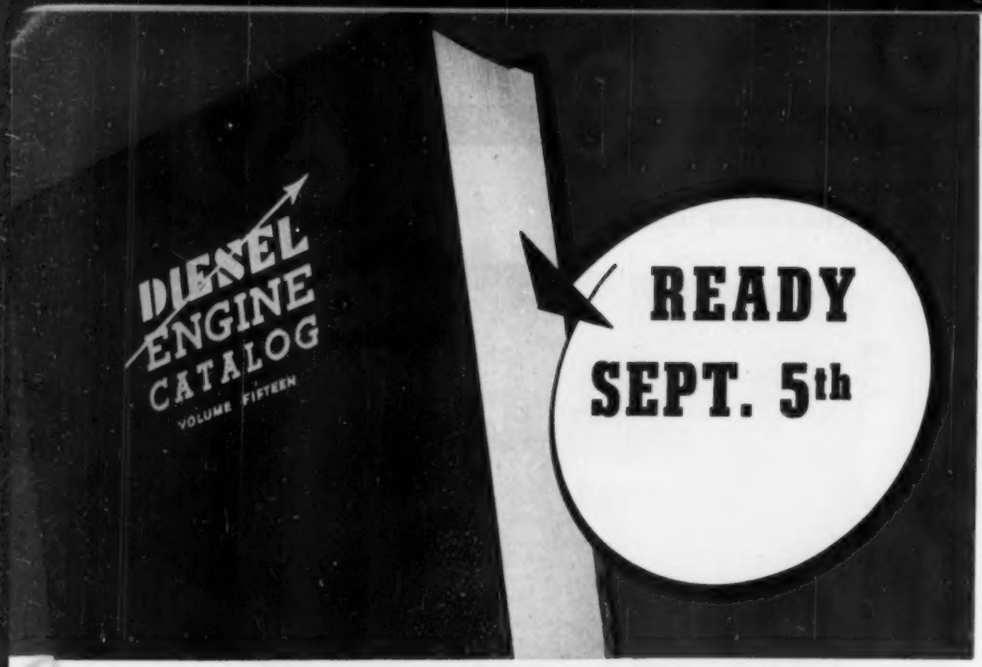

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The five separate sections break down as follows: (1) An engine section fully illustrated with complete technical descriptions and specifications. (2) An accessory section describing engine and plant accessories. (3) A transmission section describing torque converters, etc. (4) A classified buyers' guide giving you valuable information as to the source of many things you buy in this industry. (5) Advertising section.

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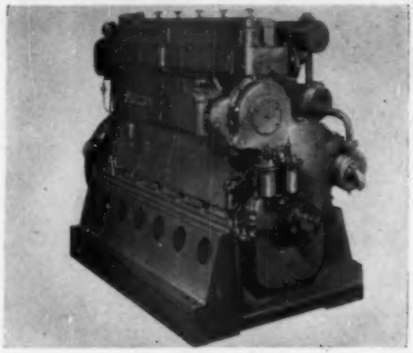
New, Lower Horsepower M-Series Stationary Diesels



A new series of smaller, heavy-duty stationary diesel engines has been announced by Enterprise Engine & Machinery Co. They are designated as the Enterprise M-series Diesels. Built in 3, 4 and 6 cylinder models, with 8-inch bore and 10-inch stroke, these engines range from 68 to 240 hp. at medium speeds of 450 to 750 rpm. All models are of the 4-cycle design. The M-series extends the lower horsepower range limit of the Enterprise diesel line from its previous range of 180 to 1,755 hp. The result of more than four years research, engineering, plant and field testing, the M-series embodies all of the more advanced design, metallurgical and operational developments in the diesel engine field. These are compact, rugged power plants, designed for continuous, heavy-duty service with minimum maintenance. Small space requirements contribute to the outstanding versatility of these medium speed, high capacity engines, while flexibility of attachment to many types of driven equipment and auxiliaries is made possible through simplicity of basic design.

Enterprise M-series diesels are completely enclosed, while all accessories are conveniently mounted for easy accessibility and servicing. Removable inspection covers allow routine checks without loss of valuable operating time. Crankpin and main bearing dimensions are of generous proportions to insure long life, low maintenance. The controlled cooling system, with water directors in cylinder heads to distribute cool water to warm areas, provides for uniform temperature throughout the cylinder block and cylinder head. The Enterprise direct injection combustion system makes easy starting practicable under all temperature conditions. These engines operate efficiently on a wide variety of fuels, including the less expensive heavy fuels.

Cooling systems with radiators, cooling towers, or evaporative coolers, are available for all M-series models as optional equipment. The structural steel base may be extended for mounting radiators and driven equipment, making a compact, self-contained unit, portable if desired. AC and DC generator sets are available in this series as a highly economical continuous or standby source of electric power for all industrial applications. The new Enterprise Bulletin No. M-16, now available on request, fully describes and illustrates M-series stationary diesel engines and generator sets. Write Enterprise Engine & Machinery Co.,

18th and Florida Sts., San Francischo 10, Calif., for your copy, or contact your nearest Enterprise office for complete information.

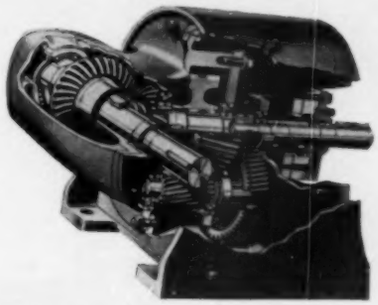
Department of Defense Conducts Diesel Tests

Washington, D.C.—Department of Defense's Transportation Corps this month revealed it was conducting tests that may eventually result in the fitting of all of its harbor craft with diesel driven units. Currently the Corps functions with a conglomeration of craft. The Transportation Corps Board, which is now studying the matter, is expected soon to recommend the number of diesel type outdoor propulsion units and their sizes that will be needed to propel all of the Corp's harbor craft. The Murray & Tregurtha model of the diesel driven outboard unit is being used in the tests. No unit is more than 200 hp. These, according to a Department of Defense official, will propel any size barge or tug in the Boat Service's fleet. Several reasons have been cited for stressing this particular specification. Propeller shafts on this type of outboard motor are manufactured in various lengths to enable them to be used on all sizes of barges and tugs. Economy dictated the proposed shift to diesel-operated outboard motor units of various sizes. Officials maintain they will keep to a minimum the number of units purchased for the test.

Corps officials are agreed that the use of diesel type on certain vessels of the Harbor Boat Service has been planned for some time. The tests will reveal the desirability of making more extensive use of the units on future acquisition for the Service fleet. Economy, they add, is the keynote of the contemplated change. Their use on barges, lighters and floating cranes will not require the services of tugs for short distances. During the last war, approximately 115-hp. gasoline units were purchased by the Corps. At the close of the war 112-hp. diesel units were added to the fleet. These were used mostly in the Southwest Pacific to move Navy-type pontoons. Navy has evinced interest in the tests. It is likely that the Navy will order a number of the units. It is mainly interested in their use with barges and landing craft. Results of the test will be coordinated with the Navy in the interest of the standardization program being promoted at all echelons by the Department of Defense in compliance with Secretary Johnson's directives.

The Murray & Tregurtha models used in the tests are ruggedly constructed for continuous, heavy-duty operation. They have 360-degree propeller thrust steering and are easily installed. An interesting feature of the unit is an elevating mechanism which enables the submerged assembly to be raised to any angle—even to an overhead position—for maintenance and repair. All models are fitted with steel shear pins which automatically sheer off when the unit strikes underwater obstacles. The assembly rides over the obstacle without loss of either power or forward propulsion. New sheer pins then are quickly and easily inserted while under way. Each model is a complete unit, including driving engine, reverse and reduction gears, engine cooling system, fuel tank.

Announces Two New Bulletins



The Falk Corporation announces the early release of two new bulletins illustrating and describing the new Falk concentric shaft speed reducer and right angle shaft all-steel speed reducer. Here are two new speed reducers, with the all-steel housing design which Falk developed to provide more rigidity, greater strength and improved appearance. These speed reducers, designed for a wide variety of power transmission requirements in almost every industry, are adaptable to: electric motor drives, belt drives, gas engine drives, chain drives, etc. They are suitable for use as a speed increaser or reducer. Rated according to standards of the American Gear Manufacturers Association. Further information may be found by writing DIESEL PROGRESS, File 46, P. O. Box 8458, Los Angeles 46, Calif.

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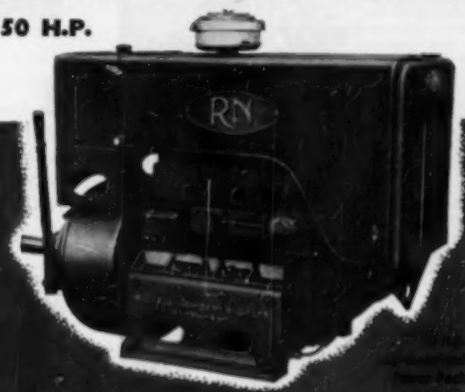
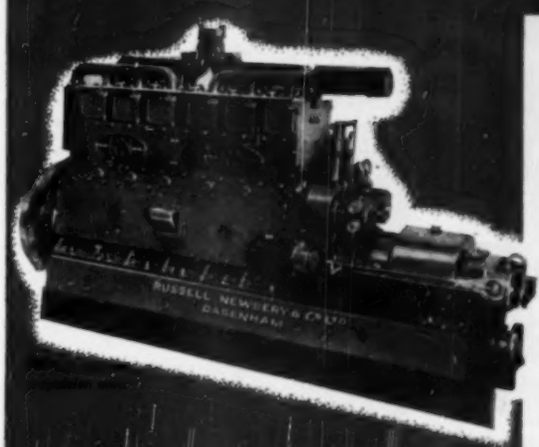
DIESEL & DUAL-FUEL ENGINES

7 to 150 H.P.



Robustly designed for continuous service and ease of maintenance and backed by forty years' experience.



INDUSTRIAL

8 models 1–6 cylinders, 7/150 h.p. at 600/1000 r.p.m.
4 models 1–4 cylinders, 13/52 h.p. at 1500 r.p.m. (B.E.S.A. ratings.)
60-cycle A.C. or D.C. Generator Sets up to 95 KW.

MARINE PROPULSION

8 models 2–6 cylinders, 18/150 h.p. at 1000 r.p.m.
4 models 2–4 cylinders, 22/48 h.p. at 1200 r.p.m.
3 models 2–4 cylinders 27/52 h.p., at 1500 r.p.m. (B.E.S.A. ratings.)

MARINE AUXILIARY

Generator, Pump and Compressor Sets for Shipboard use—range as Industrial.

APPLICATIONS INVITED from firms in the U.S.A. interested in the possible distribution of our range of diesel engines. Stock and Credit Facilities available.

RUSSELL NEWBERY & CO., LTD.

ESSEX WORKS, DAGENHAM, ESSEX, ENGLAND. Cables: Diesel, Dagenham

DISTRIBUTORS:
CANADA—CANADIAN FAIRBANKS-MORSE CO., MONTREAL AND BRANCHES
MEXICO—MAQUINARIA E INGENIERIA S.A. MEXICO D.F.
COLOMBIA—IGNACIO GOMEZ & CIA. BOGOTA

TAKE THE "EAT" out of VALVE SEATS

GRIND THEM TRUER-
GRIND THEM FASTER-

with the

WATERBURY-HALL
DIESEL TYPE
Valve Seat GRINDER

Model EDP Diesel Type Eccentric Valve Seat Grinder. Range of surface seats: 2½ to 6½". Equipped with two grinding wheel adapters.

Engine performance is improved and stays improved for longer periods. Fuel economy is renewed. Valve seat grinding takes less time, and it's done right. These are the advantages of the Waterbury-Hall Valve Seat Grinder. Any mechanic can use it to produce a factory true job. Manhours mean more with

WATERBURY-HALL
Precision-Built
PERFORMANCE

• WRITE FOR DESCRIPTIVE BULLETIN

WATERBURY TOOL DIVISION
VICKERS, INCORPORATED
A SUBSIDIARY OF THE SPERRY CORPORATION
WATERBURY 91, CONNECTICUT

NEW DIESEL TUG ENLARGES FLEET

IN its latest move to maintain a modern "balanced fleet" of tugs, McAllister Bros., Inc., recently took delivery of a new 93-foot diesel vessel, the *Dorothy McAllister*. Built by the Port Houston Iron Works, Houston, Texas, the tug arrived in New York at the end of July and was put into immediate service in New York Harbor.

The "balanced fleet" idea was developed by McAllister, one of the largest operators of towboats in the country, in order to best serve customers at the most reasonable cost. The reputation of this balanced fleet evolves from the fact that the firm operates towboats ranging from the shifting type as low as 250 hp. to the largest ocean-going tugs owned privately with horsepower ranging up to 2,200. Thus McAllister is capable of handling any assignment from the lightest shoal draft work to docking and undocking the biggest ship entering the port, and any type of lakes and long-range ocean towing required.

Its growth in more recent years stems in part from its acquisition of Card Towing Line, oldest towing company in the harbor, Lee Transit Corporation, Canal Lakes Towing, which specializes in canal and Great Lakes towing, Hudson Towboat Company and Stanwood Towing. In Philadelphia, McAllister owns and operates P. F. Martin, prominent operator in that port.

Built according to American Bureau of Shipping specifications, the *Dorothy McAllister* is capable of coast-wise service. The tug is rated at 1,000 hp., has a 23-foot beam and a gross weight of 155 tons. The main diesel is a 12-cylinder, 2-cycle General Motors (Cleveland Division) unit injection type driving an Airflex reversing clutch and Falk Corp. reduction gear. Two 45-hp. generating units are by General Motors (Detroit Division) with engine controller by Allis-Chalmers. To handle the exacting steering requirements of general harbor service, the tug has a Sperry electro-mechanical steering system utilizing a No. 2 steering engine. This engine is rated to exert a pull of 17,000 lbs., using a 5-hp. electric motor. The gear permits labor-free manipulation of the rudder from hard over to hard over by a quick flip on the rim of the steering wheel.

Among auxiliary equipment aboard is the following:

Main Diesel Air Starter—Gardner Denver Co.
Heat Exchanger, Lube Oil Cooler—Ross Heater & Mfg. Co.
Pumps—Goulds Pump Co. and Viking Pump Co.
Air Compressor Units—Quincy Compressor Co.
Auxiliary Air Tanks—Scaife.
Water Pumps—Jacuzzi.
Heating Boiler and Burner—Crane Co.
Radio Telephone, Direction Finder—RCA.

Catalogs for Industrial Connections

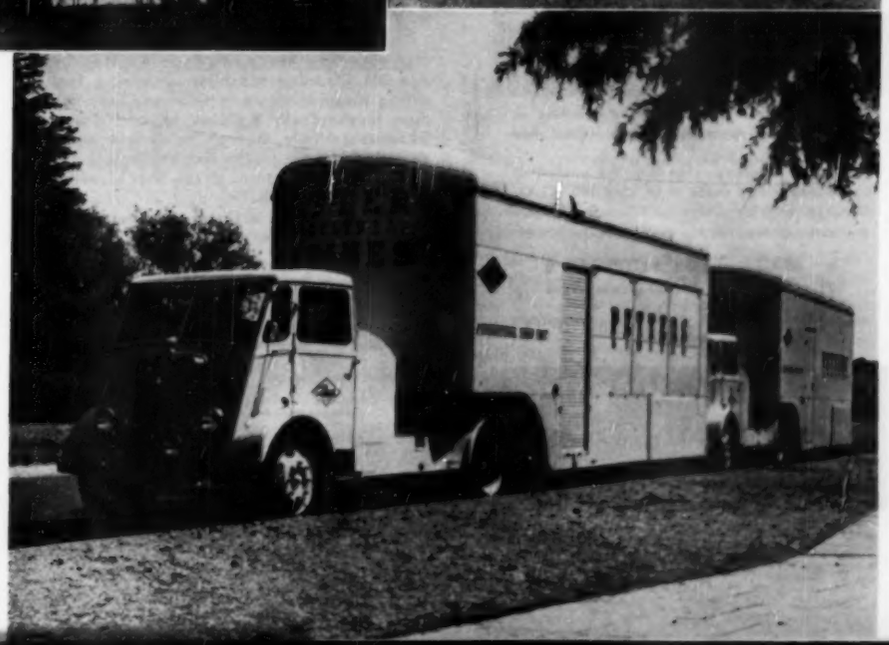
The Weatherhead Company has just completed the printing of a three pocket portfolio containing the latest catalogs covering their line of industrial hose and hose ends and tube fittings Nos. H-1451, E-1457 and F-1456. Catalog H-1451 lists The Weatherhead Company's latest development of reusable steel hose ends and industrial hose for all hydraulic purposes, fuel and oil lines for diesel engines or for any other flexible hose requirements. This material offers a range of working pressures up to 5,000 psi. with burst pressures ranging up to 16,500 psi. Catalog No. E-1457 is the latest edition of the patented Weatherhead Ermeto Steel and Stainless Steel Fittings. The Weatherhead Ermeto fitting requires no flaring, no threading, no welding, and no soldering—consists of only three parts and is easily assembled. It has been used for special instrument work at pressures up to 40,000 psi. and in the smaller sizes has been tested at hydrostatic pressure of 65,000 psi. without failure. Catalog No. F-1456 shows a complete line of brass inverted, S.A.E., compression, threaded sleeve type and pipe fittings. These fittings are made from extruded brass rod permitting large flat wrench surfaces on all elbows and tees. For complete information write DIESEL PROGRESS, File 41, P. O. Box 8458, Los Angeles 46, California.

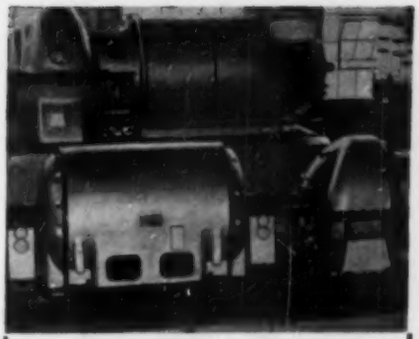
ABOE MOBILE EXHIBITION UNIT

FURTHER implementing its extensive program of cooperation with distributors and dealers, ABOE, Inc., New York, early this fall will launch on a nation-wide tour a new deluxe mobile demonstration unit which, for artistry of design and completeness of facilities, is believed to be unique in the diesel engine field. Created especially for visiting and exhibiting at agricultural and industrial exhibitions, the new self-contained demonstration unit fairly blossoms from a pair of trim trailers of conventional appearance into a gala exhibition trimmed with the latest in display signs, and equipped with the most modern facilities for service to visitors.

At present the vehicles are touring Great Britain. At the close of the summer season they will be transported to this country, where ABOE and its distributors and dealers are arranging a tour of some 8,000 miles. The unit will exhibit the well-known Petter diesel engines ranging from 3 to 36 hp. The tour will give thousands of Americans an opportunity for the first time to see these power units demonstrated. The unit will visit a number of Agricultural Expositions, and in some cases ABOE distributors will arrange separate demonstrations in the smaller towns.

The exhibition unit consists of two trailer type vehicles, each powered by a traction unit fitted with a Meadows engine, one of ABOE's diesel products. Each trailer, externally identical, is finished in a matt primrose color with suitable chromed metal lettering. The first forms the show vehicle and becomes an integral part of the exhibition, while the second is used for storage of engines and exhibition equipment, and includes the crew's living quarters. Internally the show vehicle is unique in its equipment. Stress is given by means of concealed lighting to a drawing illustrating the seasons. Opposite, in vivid contrast, is a grille feature containing illuminated photograph boxes illustrating engine applications. The walls are finished in anodized duralumin, and the ceiling is of egg-crate construction with concealed lighting from above. Steps lead up to a reception office with built-in cocktail cabinet and seating accommodation. The storage vehicle has a specially strengthened floor to take the engines and exhibition equipment while enroute. This vehicle contains the crew's living quarters and is equipped to fulfill the needs of a crew of four men.





Easy Way to Give Your Equipment that NEW LOOK!

If your Diesels, generators, other heavy equipment look a little "seedy"—smarten them up with Oakite Renovator. All you do is give them a quick rub-down with this specialized paint cleaner. Then follow with a dry-cloth polish to bring out high paint-luster.

SAFE . . . ECONOMICAL

Oakite Renovator is a solvent-emulsion type cleaner. It goes after grime in a hurry. As to fire risk . . . nothing to worry about! Oakite Renovator is mixed with water . . . it's safe to use. And from a cost angle . . . Oakite Renovator is extremely economical . . . it stands dilution very well.

FREE MANUAL gives complete story on keeping equipment clean and ship-shape. Manual also describes 70 other ways to save time and money in power plant maintenance. Discusses such subjects as:

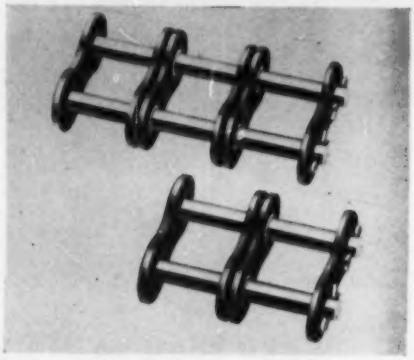
- **Descaling Cooling Systems**
- **Repair parts degreasing**
- **Reconditioning filters**
- **Cleaning hard-to-reach places by Steam-Detergent Gun**

You may have a free copy of this helpful manual merely by dropping a line to address below. No obligation, of course.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

OAKITE PRODUCTS, INC., 220 Thames St., NEW YORK 6, N. Y.
Technical Service Representatives in Principal Cities of U. S. & Canada

New Connecting Links for Roller Chains



A patented bushed center plate connecting link has been developed for use with Diamond multiple-strand roller chain for severe service. This connector made by Diamond Chain Company, Inc., Indianapolis, provides durability, closely matching that of the Diamond press-fit center plate multiple-strand chain. The same ease of connecting and disconnecting the chain is thus provided as with slip-fit center plate design links, thus simplifying the handling of multiple-strand chains. The new connectors which are being produced for ¾-inch through 2½-inch pitch Diamond multiple-strand roller chains, have file-hard bushings pressed into pitch holes of pairs of center plates making one unit with the bushings then ground for hole and pitch accuracy. Since full support is provided across all strands and both pins and bushings are hardened and polished, wear is greatly reduced. For further information write DIESEL PROGRESS, File 50, P. O. Box 8458, Los Angeles 46, Calif.

General Manager of Propeller Club

Louis B. Pate, national president of The Propeller Club of the United States, has announced the appointment of Joseph K. Carson, former member of the United States Maritime Commission, as general manager of the organization. Mr. Carson will assume his new duties immediately. After serving in the U. S. Army as a company commander overseas during World War I, Mr. Carson engaged in general law practice in his home city of Portland, Oregon, until 1933, when he was elected mayor of that city. He was re-elected in 1937 for a second four-year term, and shortly after retiring from office in 1941, he was again called for active Army duty, serving in the European theatre of operations with the Corps of Engineers. He entered service as a captain and upon release from active duty in 1946 had attained the rank of colonel. On April 1, 1947, President Truman appointed Mr. Carson a member of the Maritime Commission, which position he filled until the functions of that body were transferred to the Department of Commerce in June of this year. Mr. Carson brings to his new position a thorough knowledge of the present situation confronting the American maritime industry, and a strong appreciation of the necessity for a strong and effective American Merchant Marine.

Deficiency on Our Road Net Work

Fleets of Allis-Chalmers crawlers and new Gar Wood scrapers have tackled a 15½-mile section of the Pennsylvania Turnpike western extension northwest of Pittsburgh. A $7,108,000 grading, paving and drainage structure contract which calls for completion of the 15½-mile stretch by August 11, 1951, was let to L. G. DeFelice & Sons, contractors, North Haven, Connecticut The DeFelice operation is part of the $78,000,000 67-mile western extension running from east of Pittsburgh to the Ohio State line near Youngstown. An $86,000,000 100-mile eastern extension running from Carlisle, Pennsylvania, to the suburbs of Philadelphia is also under construction. In spite of these large scale operations, America's national highway is still woefully inadequate. Our motor vehicle population has more than doubled since 1930, excluding the 8,000,000 cars being built this year, yet highway officials report an alarming 41 billion dollar highway deficiency.

NEED TRAINED DIESEL MEN?

Hemphill graduates have received broad, practical training in the operation, maintenance, and servicing of diesel engines.

On your job they can save you money, and make you money.

GET THE KIND OF DIESEL MEN YOU NEED FROM

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Memphis
311 South Main St.
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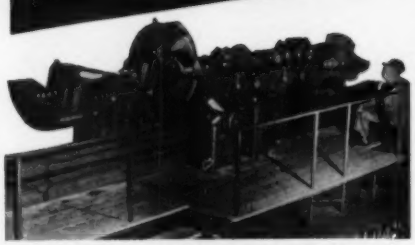
CRANKSHAFT GRINDING SERVICE



The largest Crankshaft Grinding Machine in the world used in an independent repair shop

Four machines giving range from the smallest up to crankshafts with stroke of 15" and 200" O.A.L. Complete grinding service for locomotive, stationary, marine, automotive and compressor crankshafts.

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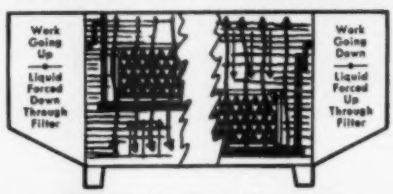
Prompt Service . . . Accurate Work

Established 1924 . . . 25 years experience grinding crankshafts!

NATIONAL WELDING & GRINDING CO.
2929 CANTON ST. DALLAS 1, TEXAS
THE MOST COMPLETE ENGINE REBUILDING SHOP IN THE SOUTHWEST

How to Clean 40 Diesel Air Filters in 5 Minutes!



CROSS-SECTION OF MAGNUS AJA-DIP ILLUSTRATING MECHANICAL AGITATION

Using the Magnus Aja-Dip Air Filter Cleaning Method you can clean up to 40 air filters, *with minimum labor*, in 5 minutes.

The 40 filters, loaded in a basket, are placed on the agitating platform in a Magnus Aja-Dip Cleaning Machine containing fast acting Magnus cleaning solution. They are then mechanically agitated up and down, 54 times a minute, through the cleaning solution. At each stroke, the cleaning solution is alternately forced through the filter element, stripping off all adhering dust, dirt and soot particles. Cleaning is faster and more complete than by any other method.

Save labor, too, rinsing, oiling and drying filters with Magnus Equipment.

Write today for complete information on Progressive Dirt Unloading with the Magnus Air Filter Cleaning Method.

MAGNUS CHEMICAL CO. • 85 South Ave., Garwood, N. J.
IN CANADA — MAGNUS CHEMICALS, LTD., MONTREAL
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CLEANERS • EQUIPMENT • METHODS

NEEDS NO SEALING COMPOUND

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DRYSEAL

THREAD

PRESSURE PLUG

. . . seals pressure-tight without the use of sealing compounds. Features the "Dryseal" Pipe Thread originally developed for use with SO_2, ammonia, and other refrigerants. Offers a valuable solution to leakage problems in high pressure equipment of all kinds.

Unique design of the "Dryseal" Thread provides actual crushing and sealing at both major and minor diameters, effectively preventing spiral leakage, even under extreme pressures.

Incorporates all the important features of the regular UNBRAKO Pressure Plug, including fully formed threads, uniform taper and perfect roundness.

A full range of sizes from 1/16" to 1¼". National Pipe Thread Fuel, is available. Full details are given in Bulletin 675.

OVER 47 YEARS IN BUSINESS

See us at Booth 2434, Convention of National Metal Congress and Exposition, Chicago, Oct. 23 to 27.

STANDARD PRESSED STEEL CO.

JENKINTOWN 7, PENNSYLVANIA

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FOR DEPENDABLE FUEL INJECTION EQUIPMENT

ADECO

YOUR STAND-BY FOR Fuel Injection Equipment and Replacement Parts for Maintenance

ADECO PRODUCTS, INC.
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NEW YORK DISTRIBUTOR: SEVEN SEAS SUPPLY CO.
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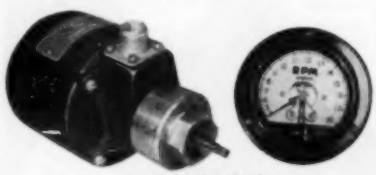
New . . .
ELECTRIC
TACHOMETERS
Simplified RUGGED Design!



Precision at Low Cost!
A quality precision tachometer unit engineered to your specifications with scales calibrated to your requirements. Elimination of wearing parts assures sustained accuracy. Non-directional or indicating forward and reverse.
PRICE: $34.00 AND UP
WRITE FOR HELPFUL BULLETIN
The ELECTRO-MECHANO Co.
161 EAST ERIE ST. MILWAUKEE 2, WIS.

New Price Schedule Announced by Burgess Manning

A new price schedule has been announced here by the Burgess-Manning Company, designers and builders of noise abating equipment for industrial, utility, construction, transportation, maritime and other fields. "The new prices are both above and below those previously issued, but in general they are lower," Dudley W. Day, director of marketing, stated in a bulletin for company representatives, manufacturers of engines, compressors, vacuum pumps, blowers, and for dealers. The new price schedule opens up the line and makes several widely used designs of Snubbers available for all types of equipment and installations, including those few critical jobs requiring the utmost in silencing, Mr. Day said. Burgess-Manning Company are manufacturers of engine exhaust "Snubbers" which prevent noise by removing the cause before it occurs. The company also produces various type of air intake Snubbers to reduce noise and snub incoming air pulse.

International Harvester Announces Two New Catalogs

International Harvester announces two new 24-page catalogs describing the new International TD-14A and TD-18A crawler tractors. Produced in two colors, these catalogs contain pictures, sectional views, and diagrams fully illustrating the features of the new crawler tractors. For further information write DIESEL PROGRESS, File 47, Box 8458, Los Angeles 46, Calif.

Stewart & Stevenson Services Expands

Appointment of Stewart & Stevenson Services, Inc., Houston, as a franchise dealer for Chrysler marine engines, has been announced by Joe Manning, general manager, Stewart & Stevenson Services. Complete parts and service, as well as the new line of Chrysler marine engines, will be available at all Stewart & Stevenson branches, Mr. Manning said. The new 1950 Chrysler engines feature a greater power range plus new low cost hydraulic clutch control and heavy duty, built-in front power take-off. The appointment of Stewart & Stevenson as dealer for Chrysler marine engines makes available to owners and potential owners of Chrysler marine engines the same brand of dependable service that has made Stewart & Stevenson so strong in the diesel field on the Texas Gulf Coast. Stewart & Stevenson Services, who claim to be the nation's largest distributors of GM diesel engines, maintains sales and service branches at Houston, Corpus Christi, Dallas, Lubbock, McAllen, Wichita Falls.

It's CONTROL THAT COUNTS

For your automatic engine . . .
SYNCHRO-START CONTROLS are unequalled in performance, economy, safety, dependability and protection.

Eighteen years of manufacturing controls, ranging from a simple switch to multiple engine control panels, have given SYNCHRO-START the "know-how" to make a thoroughly DEPENDABLE CONTROL.

When you order your engines – SPECIFY SYNCHRO-START controls. Your manufacturer, dealer, engineering firm, or architect can furnish you with the correct control. Or write us direct.

SYNCHRO-START PRODUCTS, INC.
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CHICAGO 14, ILLINOIS

NEED FORGINGS?

Specify Precision
TITUSVILLE FORGINGS
Write for Bulletin
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AIR COOLED
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DIESEL
$275.00

SEND FOR DESCRIPTIVE FOLDER

Crofton
DIESEL ENGINE COMPANY
San Diego, California

KURZ AND ROOT
GENERATORS AC and DC

BACKED BY OVER 50 YEARS EXPERIENCE SERVING INDUSTRY

Modern design, efficient performance, long life with minimum maintenance, whether powered by electric, gasoline or Diesel, have made Kurz and Root Generators standard equipment for many leading manufacturers. Kurz and Root Generators have built-in quality that is instantly recognized. Tell us your specific needs and applications . . . we'll gladly recommend the type generator to give you the service desired.

Our AC and DC Generators are adaptable to cranking Diesel and Gasoline engines against full compression . . . silicone (Class H) insulation available.

AC Generators in ratings 1 to 100 KVA can be furnished. Top illustration is a two-bearing self-excited, self-regulated type . . . lower, two-bearing direct connected exciter type.

DC Generators are available in ratings 1 to 100 KW. At the right is a two-bearing self-excited type . . . also available with direct connected exciter.

AC and DC Generators can also be furnished in single bearing, flange mounted type . . . sealed, pre-lubricated, ball bearing construction.

KURZ and ROOT Company
Since 1899
APPLETON · WISCONSIN
. . . . and DC motors and motor generator sets

at your SERVICE

Diesel Trained Men

• U.E.I. graduates are energetic, ambitious Diesel-thinking men.

Our thorough practical training in operating, maintaining and repairing of Diesel equipment gives these graduates sound fundamentals . . . couple this to their faith in Diesel's future, and you have the kind of men you want to grow with you.

Such men are available for any part of U. S. and Canada. Just let us know your needs.

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ENGINEERING INSTITUTE
Diesel Division
2523 Sheffield Avenue
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Founded in 1927

WEST COAST DIESEL NEWS

By FRED M. BURT

MARTHA, powered with a 90-hp. Washington diesel, recently commissioned, is the first of three 54-ft. all welded steel trawlers, completed by National Steel & Shipbuilding Corp., San Diego, for Productos Congelados, S. A. Guaymas, Mexico.

INSTALLED in new research laboratory at Univ. of California at Los Angeles, as standby for light and power, a "Caterpillar" 60-kw. diesel-electric generating set, equipped with full automatic "Synchro-Start" controls.

WITH EACH of the units powered by NHB 200-hp. Cummins diesel engines, 20 new Peterbilt Cab-Over-Engine tractors purchased by Pacific Intermountain Express, with 20 Peterbilt trucks for Miles & Son, Merced, Calif., cement haulers.

NEWEST addition to San Pedro purse seiner fleet, 55-ft. *New San Antonio,* from Al Larson yard, Terminal Island, is powered with a 120-hp. Atlas diesel; owners are Frank Iacono and Isador Califano, San Pedro.

THE 42-FT. steel trollers, *Suzy* (Capt. Samuel Frey, Seattle), *Blaze* (Hansen Bros., Prince Rupert, B. C.), are the first American fishing vessels on the Pacific Coast equipped with new Twin Disc Model MGH-220 hydraulic gears; each of the new boats is powered with a D318 "Caterpillar" diesel.

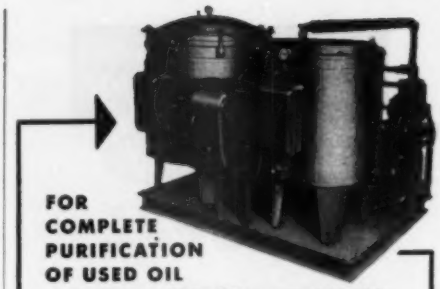
TWO DIESEL-POWERED clippers on ways at Tacoma Boatbuilding Co., 120-ft. *Countess* for Tony Francisco and others, San Diego, to have 600-hp. Washington engine; *Cape Vincente,* 91ft. vessel for Vince Gann and associates, DeFever designed, 400-hp. Enterprise with twin General Motors 100-kw. diesel auxiliaries.

THE CHRYSLER Marine Div. of Atlas Imperial Diesel Engine Co., on Terminal Island, has been purchased by Engine Sales & Service (Los Angeles), owned by Emil Riutta (who has been in diesel "engine sales and service" on the Pacific Coast for 20 years). The new branch will engage in sales and service for Witte, Murphy, and P & H diesels, for which the company is distributor.

MOVING to a new location more convenient for boatmen, adjacent to Fisherman's Wharf, San Francisco, Hall-Young Co., distributors of marine engines and allied equipment (exclusive Northern California distributors for Lister-Blackstone and Graymarine diesels), have a new building with expanded facilities.

FOUR 177-FT., twin-screw, diesel-electric propelled lighthouse tenders for French Ministry of Public Works, recently completed at yard of Yarrows, Ltd., Victoria, B.C., are driven with two 440-hp. Westinghouse motors powered with two 500-hp. Cooper-Bessemer diesels.

A NEW 1,000-hp. (at 7,000 feet elevation) Worthington diesel for American Smelting and Refining Co., San Luis Potosi, Mexico, will have an Engineering Controls "Vapor Phase" unit for tem-



FOR COMPLETE PURIFICATION OF USED OIL

The Hoffman Oil Conditioner saves lube oil by removing solubles and insolubles—saves centrifuge maintenance costs. Capacities of 50 to 600 g.p.h. Write for Bulletins A-467 and A-668.

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MACHINERY CORPORATION
FILTRATION DIVISION, 712 LAMSON ST., SYRACUSE 6, N. Y.

PORUS-KROME
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The Answer to Diesel Liner Wear.

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PETROMETER
FOR ALL TANKS
FOR ALL LIQUIDS
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FOR ALL DISTANCES
PETROMETER CORPORATION
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DIESEL GENERATOR SET, new, 150 KW, Model 40G six cylinder Superior Diesel Engine, Burke 187 KVA Generator and auxiliary equipment. Immediate delivery. Attractive price. Kiloatrick's Bakery, 2030 Folsom Street, San Francisco 10, Calif.

For Better Crankshafts, Consult
NATIONAL FORGE

We Make Our Own Electric Steel

perature control and complete waste heat recovery to provide low pressure steam for unit heaters in the miners' change room, for a 600-gal. hot water storage tank, and to heat engine fuel oil allowing use of cheaper heavy oil.

THE THIRD unit thus re-powered for use in the yard of Berg Metals Co., Los Angeles, is an Industrial Brown Hoist, using a "Caterpillar" 80-hp. diesel engine and Twin Disc Torque Converter.

PURCHASED by Fortier Transportation Company, Fresno, Calif., 29 Kenworth tractors powered with 200-hp. Cummins diesel engines.

THE 96-FT. tuna clipper *Cabrillo*, under construction by Peterson Boat Bldg. Co., Tacoma, for Anthony Madruga and associates, designed by Arthur DeFever, will be powered with a 400-hp. Enterprise diesel.

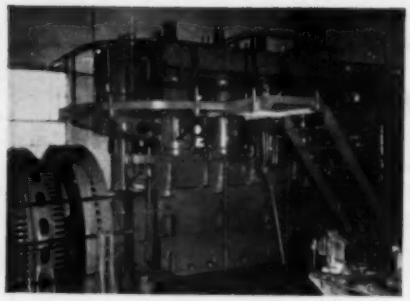
PURCHASED by U. S. Pumps, Inc., Los Angeles, from Engine Sales and Service, a 12-hp. Witte diesel to power a deep-well turbine pump for irrigation use at Allen Ranch, Sacramento.

THE NEWEST and most elaborate ship to join the 16-vessel fleet of the Seattle Sea Scouts is the 40-ft. ketch, *Yankee Clipper*, powered with a 200-hp. Hercules diesel. Built for the sea explorer unit of the West Seattle Lions Club. Skipper is H. G. Runnings.

RESIGNING as secretary-treasurer of the Kenworth Truck Co., John Cannon is heading two new companies: Cummins Diesel Sales Corp., of Washington, with a new 20,000 sq. ft. building under construction in Seattle, will service Western Washington and Alaska; Cummins Diesel Sales, Inc., Spokane, John Peters, manager, will handle Eastern Washington, Northern Idaho and Western Montana.

RE-POWERED with a 350-hp. General Motors diesel, the big tuna seiner *Three Star*, purchased by Tacoma Boatbuilding Co. from Capt. Andrew Marinkovich, will fish out of Pascagoula, Miss., to supply a Tacoma-owned plant under construction to process menhaden.

POWERED with a 165-hp. General Motors diesel driving through a Twin Disc clutch and reverse gear is a new 43-ft. combination built at Sausalito (Calif.) boat works, for sardines or albacore.



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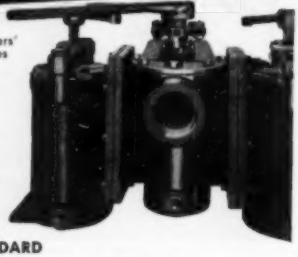

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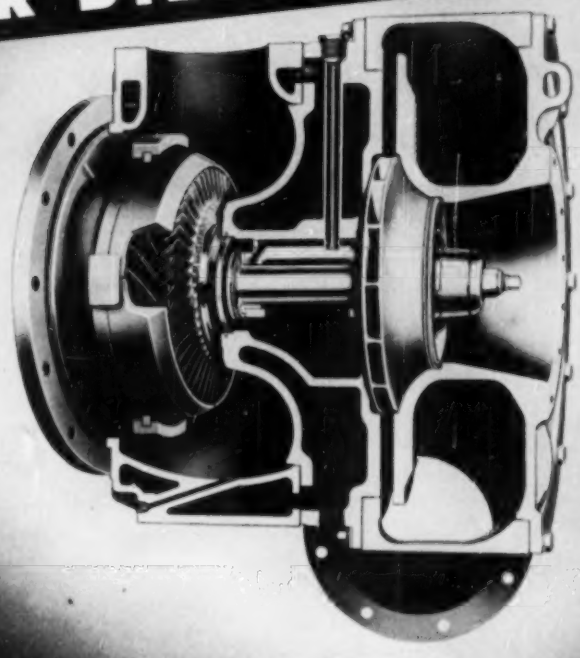

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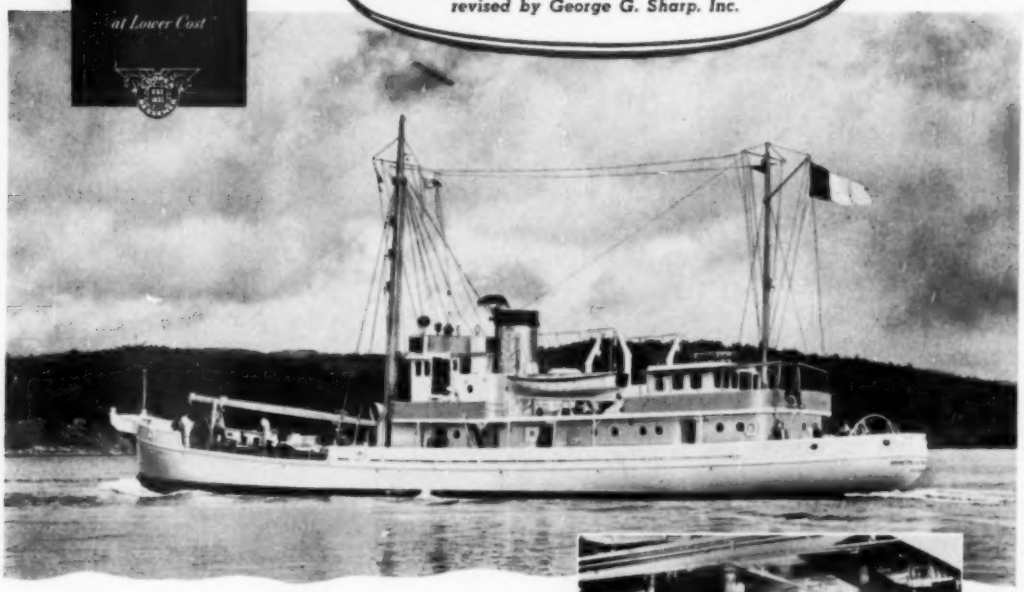

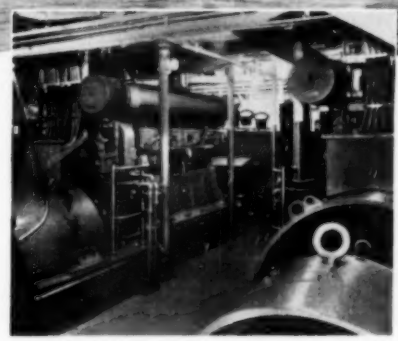

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